NOTES TO CHAPTER I

1. From *You Shall Know Them* by Vercors, copyright 1953 by Jean Bruller, with permission of Little, Brown and Company, Publishers. A paperback reprint of it has just been published. I heartily recommend Vercors' novel not only for the pleasure of a well-told story, but also for a learned exploration of the criteria involved in differentiating between humans and other animals.

2. The first series of Encyclopaedia Britannica Lectures at the University of Chicago in 1964, published in 1965.

3. See *The Conditions of Philosophy*, Chapter 2, esp. pp. 21–38.

4. See *ibid.*, Chapter 2, pp. 38–42; Chapters 6–7; and Chapter 12, esp. pp. 216–217. Let me stress the two related aspects of every mixed question. On the one hand, philosophy, as we have seen, is indispensable in the clarification of the question and in laying down the criteria for interpreting and judging the relevance and force of the evidence obtained by investigation. On the other hand, since the mixed question is not beyond the scope of investigation, it can never be adequately answered on the basis of common experience alone. Purely philosophical answers to mixed questions are corrigible by science, just as common sense is corrigible when the latter forms opinions about matters on the basis of common experience alone, in spite of the fact that special experience is obtainable and should be sought.

   Not all mixed questions are of the same type. Some arise from an apparent conflict between science and common-sense opinion. These serve to test the truth of competing philosophical theories by challenging them to resolve the conflict without giving up either the truth of common-sense opinion or the truth of science. I dealt in *The Conditions of Philosophy* with a striking example of this type of mixed question, involving a conflict between the common-sense beliefs in the reality of the individual physical objects of common experience and the assertion, by some scientists, of the reality of elementary particles. The mixed question about man is of a different sort. Here the solution of the problem of how man differs requires us to consult all the relevant scientific data and theories

and to bring to bear on them the applicable philosophical analysis and arguments. It requires us, in addition, to have recourse to philosophical thought in order to get the question itself properly framed and understood and in order to lay down criteria for interpreting and judging scientific evidence and philosophical arguments in their relation to each other. But what is most extraordinary about the mixed question concerning man, as will become apparent in the concluding chapters of Part Two, is that we can envisage in the future the possibility of scientific efforts that will have the effect either of falsifying a traditional philosophical theory or of confirming its relative truth.

NOTES TO CHAPTER 2

1. *Politics*, I, 13, $1259^{b}37$.
2. George and Muriel Beadle, *The Language of Life*, 1966.
3. J. Bronowski, *The Identity of Man*, 1965, pp. 2, 4.
4. *Ibid.*, p. 8.
5. *Ibid.*, p. 48. When, on this page, Bronowski attributes to man the unique gift of conceptual ability, he appears to have forgotten that, on pages 11–12, he had rejected the fallacious assumption that man, if he is to be unique, "must be endowed with uniqueness as if it were a physical gift, from conception."
6. Michael Scriven, *Primary Philosophy*, 1966, pp. 177–178.
7. *Ibid.*, p. 197.

NOTES TO CHAPTER 3

1. For a fuller description of the dialectical method, see *The Idea of Freedom*, Volume I, 1958, pp. xvii–xxiv, and 3–79.

NOTES TO CHAPTER 4

1. *Op. cit.*, Chapter 8, esp. pp. 137–142.
2. The following is an indication of exemplary or capital passages on the point:

   PLATO: *Protagoras*, 320d–322c; *Timaeus*, 42a–c; *Theaetetus*, 185a–186d; *Cratylus*, 399b.

ARISTOTLE: *On the Soul*, II, 3, 414^{b}–$415^{a}13$ (cf. *ibid.*, III, 3); *History of Animals*, VIII, 1, $588^{a}23$–31; *Parts of Animals*, IV, 10, $686^{a}27$–32; *Generation of Animals*, I, 23, 731^{a}–30–35; *Nichomachean Ethics*, I, 7, $1097^{b}33$–$1098^{a}8$; *Politics*, I, 2, $1253^{a}7$–37; I, 5, $1254^{b}15$–23; III, 9, $1280^{a}31$–34; VII, 13, $1332^{b}3$–6; *Rhetoric*, I, 1, $1355^{b}1$–3.

EPICTETUS: *Discourses*, I, 6; IV, 7.

MARCUS AURELIUS: *Meditations*, II, 16; IV, 4; VI, 23; VII, 55.

AUGUSTINE: *City of God*, V, 11; VII, 23; VIII, 6; *On Christian Doctrine*, I, 8.

AQUINAS: *Summa Theologica*, I, 18, 2 ad 2; I, 18, 3; I, 19, 10; I, 59, 3; I, 75, 3; I, 76, 1; I, 76, 4; I, 77, 5; I, 78, 1; I, 83, 1; I, 86, 4 ad 3; I–II, 50, 3 ad 2.

DESCARTES: *Philosophical Works*, trans. by E. S. Haldane and G. R. T. Ross: Volume I, pp. 109–110, 115–118; Volume II, pp. 104–105, 243–245, 343.

SPINOZA: *Ethics*, Part III, Prop. 57, Scholium; Part IV, Prop. 37, Scholium 1.

PASCAL: *Treatise on the Vacuum*, Preface; *Thoughts*, Nos. 339, 344, 346, 358, 365, 418.

LOCKE: *Essay Concerning Human Understanding*, II, i, 10–11; III, i, 1–3; IV, xvii, 2; IV, xviii, 11. Cf. II, xxvii, 8; III, vi, 22.

LEIBNIZ: *Leibniz Selections*, ed. by P. P. Wiener, pp. 339–342, 355–367, 371–372, 390–394, 419, 456–458, 503–508; *The Monadology and Other Philosophical Writings*, ed. by R. Latta, 2nd. ed., pp. 50–57, 126–133; *The Philosophical Works of Leibniz*, ed. by G. M. Duncan, 2nd ed., pp. 279–283, 404–405; *Philosophical Writings*, Everyman edition, pp. 8, 18, 24, 28, 86–87, 99–100. Cf. Bertrand Russell, *A Critical Exposition of the Philosophy of Leibniz*, 1900: pp. 141, 264–266.

ROUSSEAU: *The Social Contract and the Discourses*, Everyman edition, 1913: pp. 183–184, 192–193.

KANT: *Critique of Pure Reason*, trans. by J. M. D. Meiklejohn, pp. 300–301; *Critique of Practical Reason and Other Works on Ethics*, trans. by T. K. Abbott, pp. 63–65, 71–72, 152–153; *Critique of Aesthetic Judgment*, trans. by J. C. Meredith, p. 49; *Critique of Teleological Judgment*, trans. by J. C. Meredith, p. 136, fn. 1.

HEGEL: *Philosophy of Right*, trans. by T. M. Knox, Additions, Nos. 4–5, 10, 22, 121; *Philosophy of History*, trans. by J. Sibree, pp. 8, 33–34, 70.

3. *Op. cit.*, pp. 184, 192–193.

4. *Ethics*, Part I, Appendix; Part II, Prop. 48; Part IV, Preface.

5. See passages cited in note 2, *supra*.

6. *Op. cit.*, Volume I, pp. 109–110, 115–118; Volume II, pp. 104–105.

7. For passages critical of Descartes or in a contrary vein, see Locke, *op. cit.*, II, x, 10; II, xi, 11; Leibniz, *New Essays*, II, x, 10; II, xi, 11; Kant, *Critique of Teleological Judgment*, Sections 66, 78–81.

8. The following indicates passages in which the rational soul is distinguished from the souls of animals and plants, or in which the mind, the reason, the intellect, or the will is distinguished from the senses and the passions, by virtue of its spiritual (its non-physical or immaterial) nature:
   ARISTOTLE: *On the Soul*, I, 1, 403^{a}3–10; II, 2, 413^{b}24–30; III, 4–5.
   AUGUSTINE: *Confessions*, VII, 1–2; *City of God*, VIII, 5; *Immortality of the Soul*, Chapters X, XIII–XVI.
   AQUINAS: *Summa Theologica*, I, 75, 2, Resp. and ad 1–3; I, 75, 3; I, 75, 6.
   DESCARTES: *Op. cit.*, Volume I, p. 101; Volume II, pp. 211–212.
   LOCKE: *Op. cit.*, II, xxiii, 18, 32. Cf. *per contra*, IV, iii, 6.
   ROUSSEAU: *Op. cit.*, pp. 183–184.
   KANT: *Critique of Teleological Judgment*, pp. 131–132.
   HEGEL: *Philosophy of Right*, Additions, No. 22.

9. The following indicates passages in which the point is made or adumbrated:
   ARISTOTLE: *Parts of Animals*, IV, 10, 686^{a}27–32.
   EPICTETUS: *Discourses*, I, 3, 9; II, 8.
   AUGUSTINE: *On Christian Doctrine*, I, 22.
   AQUINAS: *Summa Theologica*, I, 93, 1–6; I–II, Prologue.
   PASCAL: *Thoughts*, No. 430.
   DESCARTES: *Op. cit.*, Volume II, pp. 170–171.
   LEIBNIZ: *Discourse on Metaphysics*, xxxiv–xxxv.
   HEGEL: *Philosophy of History*, pp. 33–34, 333–334.

10. *The Works of William Harvey*, trans. by Robert Willis, pp. 368–369, 425; Montesquieu, *The Spirit of Laws*, I, 1; Adam Smith, *The Wealth of Nations*, Modern Library Edition, pp. 12–15.

11. *Op. cit.*, II, xxvii, 8; III, vi, 22. Cf. *ibid.*, III, vi, 7–11. For Leibniz's critique of Locke's treatment of real and nominal essences, see *New Essays*, III, vi, 22.

12. Though both Locke and Rousseau assert, in a number of passages, that man differs in kind from brute by virtue of intellectual or volitional powers that man alone possesses, they flatly contradict themselves in other passages by asserting that man differs from other animals, especially the primates, *only* in degree. See Locke, *op. cit.*, III, vi, 12; III, x, 17; III, xi, 20; IV, xvi, 12; Rousseau, *op. cit.*, pp. 177–187, 192 ff. In regard to Rousseau, vd. Arthur O. Lovejoy, *The Great Chain of Being*, 1948: p. 235.

13. *Op. cit.*, III, vi, 12. Cf. *ibid.*, IV, xvi, 12. See also Leibniz's commentary on these passages in *New Essays*, III, vi, 12; IV, xvi, 12.

14. *Leibniz Selections*, pp. 184–188, 378; *The Monadology and Other Philosophical Writings*, pp. 36–39, 126–133; *The Philosophical Works of Leibniz*, pp. 33–37. See also Russell's critique of Leibniz with regard to the continuum of forms, in *A Critical Exposition of the Philosophy of Leibniz*, pp. 63–66, 222–223; and Lovejoy's comment on Russell, in *The Great Chain of Being*, p. 355, n. 84.

15. See *The Great Chain of Being*, pp. 253–254, 269–270, 275–277.

16. *Ibid.*, p. 332.

17. *Leviathan*, pp. 18, 22–23, 31, 34–35, 46–47, 130–131, 160–161.

18. See *La Mettrie's L'Homme Machine*, critical edition with an introductory monograph and notes by Aram Vartanian, 1960. Cf. Frederick A. Lange, *History of Materialism*, 3rd ed., trans. by E. C. Thomas, 1925: pp. 75–76; also *A Textbook of Marxist Philosophy*, prepared by the Leningrad Institute of Philosophy, trans. by A. C. Moseley, ed. by John Lewis, pp. 45–50.

19. See Lange, *op. cit.*, Book I, Section 1, Chapters 1–2, 4; Section 3, Chapter 1; Section 4, Chapter 3; Book II, Section 1, Chapter 2; also see Richard Falckenburg, *History of Modern Philosophy*, 1893: pp. 61, 255–256, 593–595; G. V. Plekhanov, *Essays in the History of Materialism*, 1934: pp. 6–7, 91–92. One passage in Ludwig Feuerbach's *Essence of Christianity* asserts that man differs in kind from other animals, and may anticipate the Marxist view of that difference in kind as being merely superficial, not radical (see pp. 1–3). For a critique of Feuerbach on this point, see Friedrich Engels, "German Ideology," in *Handbook of Marxism*, pp. 219–220.

20. *Enquiry Concerning Human Understanding*, Section IX, 82–85; Section XII, Part 1, 118.

21. *Essays*, trans. by Charles Cotton, revised by W. C. Hazlett: Volume 4, pp. 230–240; Volume 5, pp. 13–15. For the passages in a contrary tenor, see Volume 5, pp. 91–93, 188–191.

22. See V. I. Lenin, "The Teachings of Karl Marx," in *Handbook of Marxism*, pp. 538–543; *A Textbook of Marxist Philosophy*, pp. 45–50; Plekhanov, *op. cit.*, pp. 172–175; K. N. Kornilov, "Psychology in the Light of Dialectic Materialism," in *Psychologies of 1930*, ed. by C. Murchison, pp. 243–278.

23. See *Handbook of Marxism*, pp. 211–213; *A Textbook of Marxist Philosophy*, pp. 99–102, 108–112; Plekhanov, *op. cit.*, pp. 205–209, 271–276; Kornilov, *op. cit.*, pp. 246–248.

24. See Kornilov, *op. cit.*, pp. 246–248.

25. See *A Textbook of Marxist Philosophy*, pp. 285–288, 294–297, 348–353; Plekhanov, *op cit.*, pp. 172–175.

26. *Critique of Pure Reason*, pp. 367–376. See reference to Leibniz, p. 374, fn.; see also Lovejoy's comments on Kant in regard to Leibniz in *The Great Chain of Being*, pp. 240–241.

27. *Op. cit.*, VIII, 3, $1043^{b}35$–$1044^{a}9$. An even clearer statement of the hierarchy of species is to be found in *On the Soul*, II, 3, $414^{b}20$–31, where Aristotle compares the order of living species, constituted by the vegetative, the sensitive, and the rational soul, to the order of plane figures (triangle, quadrangle, pentagon), between which no intermediates are possible. See also *ibid.*, $414^{a}28$–$414^{b}20$, and II, 4.

28. *Op. cit.*, VIII, 1, $588^{b}4$–22. The opening sentence of this passage, which should be read in its entirety, would appear to be contradicted by the following statement in Aristotle's treatise *On Plants*: "It is certainly difficult to find a state intermediate between life and the absence of life" ($815^{b}36$). But there is no contradiction here, any more than there is between this passage in the *History of Animals* (where Aristotle calls our attention to the scale of degrees of vitality within the plant kingdom and the scale of degrees of vitality, mobility, and sensitivity within the animal kingdom) and the passages in the *Metaphysics* and in *On the Soul* (cited in note 27, *supra*), in which Aristotle asserts the hierarchy of species, a scale not of degrees but of grades of perfection in being, between any two proximate members of which intermediates are impossible. For Aristotle, the fundamental *reality* is the hierarchy and discontinuity of species, though he also acknowledges the *appearance* of continuity in the ascending scale of degrees of vitality by which we pass from lower to higher forms of life; and, in addition, as an empirical biologist, he candidly confesses the difficulty of determining whether a particular specimen is to be classified as a plant or as an animal. In an earlier book, I have tried to show how all these passages dealing with the order of species, and bearing on hierarchy and continuity in nature, can be consistently put together. See *Problems for Thomists: The Problems of Species*, 1940: pp. 52–58, 102–109, 260–263. Professor Lovejoy, aware of the apparently conflicting texts in Aristotle on hierarchy and continuity, leaves the apparent contradiction unresolved (see *The Great Chain of Being*, pp. 55–58). Professor Toulmin likewise tends to find two quite disparate and irreconcilable views in Aristotle—one held by Aristotle the metaphysician and the other by Aristotle the empirical biologist (see *The Discovery of Time*, 1965: pp. 44–45, 50–52).

29. For the passages in Aquinas that comment on and adopt the Aristotelian conception of the hierarchy of species and the Aristotelian observations of continuity in the scale of degrees manifested by the forms of life, see *Summa Theologica*, I, 5, 5; I, 47, 2; I, 76, 3; I, 76, 4; I, 78, 1; *Summa Contra Gentiles*, II, 91; II, 95; IV, 41; *Disputed Questions on the Soul*, Q.1, A.7. I have dealt with these pas-

sages, along with the comparable ones in Aristotle, in *Problems for Thomists: The Problem of Species* (see pages cited in note 28, *supra*).

NOTES TO CHAPTER 5

1. Robinet's *Philosophical Considerations on the Natural Gradations of the Forms of Being* was published in 1768. For an available summary of Robinet's views on the continuity of nature and on the unreality of kinds, see Lovejoy, *The Great Chain of Being*, pp. 269–270, 275–279.

2. *Histoire Naturelle* (1749), I, 38. Cf. Lovejoy, *op. cit.*, pp. 229–230, 283–286.

3. See Lovejoy, *op. cit.*, pp. 230–231, 233, 235.

4. See note 1, *supra.*

5. See Lovejoy, *op. cit.*, pp. 235, 272.

6. *Essay Concerning Human Understanding*, III, vi, 12; IV, xvi, 12.

7. *The Social Contract and the Discourses,* Everyman edition, pp. 177–187, 192 ff. Cf. Lovejoy, *op. cit.*, p. 235.

8. See Lovejoy, *op cit.*, p. 197.

9. I am indebted to Professor Lovejoy for this insight. See *op. cit.*, Chapter IX; and cf. S. Toulmin and J. Goodfield, *The Discovery of Time*, Chapter 8.

10. See *Origin of Species and The Descent of Man*, Modern Library edition: p. 361.

11. For a fuller discussion of apparent differences in kind, the reader is referred back to Chapter 2, pp. 23–24.

12. See Darwin, *op. cit.*, pp. 86–96, 98–100, 275–277, 351–352, 370. Cf. A. J. Cain, *Animal Species and Their Evolution*, 1954: p. 182.

13. *Op. cit*, p. 370.

14. See Ernst Mayr, *Animal Species and Evolution*, 1963: pp. 89, 110, 338, 348–349, 403, 428, 431, 449, 450, 480–482, 516–518, 546–547, 554–555, 586–587, 620; Julian Huxley, *Evolution, The Modern Synthesis*, New York, 1942: pp. 154–155, 171–173; A. J. Cain, *op cit.*, pp. 69, 72–73, 130, 132–133, 135, 168, 176, 179, 181–182.

15. See Mayr, *op. cit.*, pp. 422–424; Julian Huxley, *op. cit.*, pp. 164–165, 168–170.

16. T. Dobzhansky, *Mankind Evolving*, 1962: p. 203. Cf. G. G. Simpson, *The Major Features of Evolution*, 1953: pp. 379–380, 384, 389.

17. See Dobzhansky, *op. cit.*, pp. 183, 186, Mayr, *op. cit.*, pp. 358–359, 422–423, and esp. 424; Julian Huxley, *op. cit.*, pp. 164–165, 168–170; and A. J. Cain, *op. cit.*, p. 130.

18. *Genetics and the Origin of Species*, 1937: p. 259. Cf. his *Mankind Evolving*, p. 186, written almost thirty years later.

19. See *op. cit.*, pp. 389–391.

20. *Antiquity of Man* (1863), Everyman edition, pp. 392–393. The whole of the concluding chapter is worth reading.

21. See Loren Eiseley, *Darwin's Century*, 1958: p. 267.

22. See A. E. Wallace, *Contributions to the Theory of Natural Selection*, 1871: Chapter 10. Cf. Eiseley, *op. cit.*, pp. 304–313.

23. *Man's Place in Nature and Other Anthropological Essays*, 1898: p. 155. See *ibid.*, pp. 157–208 for Huxley's discussion of the Engis and Neanderthal skulls.

24. *Op. cit.*, p. 494–495. Cf. *ibid.*, pp. 446, 911–912, 472–473.

25. *Ibid.*, pp. 512–513.

26. See *ibid.*, pp. 461–464.

27. *Ibid.*, p. 465. Cf. Eiseley, *op. cit.*, pp. 288–289; 323; and see also MacDonald Crichtley, "The Evolution of Man's Capacity for Language," in *Evolution After Darwin*, ed. by S. Tax, 1960: Volume II, pp. 290–291, 307–308.

28. See *op. cit.*, p. 431. Cf. *ibid.*, pp. 431–432, 541, 912.

29. See *ibid.*, pp. 513–514, 520–521.

30. See *ibid.*, p. 521; and cf. *ibid.*, pp. 911–915.

31. *The Creed of Science*, 1881: p. 161. Cf. Eiseley, *op. cit.*, pp. 257, 345–346.

NOTES TO CHAPTER 6

1. See T. Dobzhansky, *Mankind Evolving*, 1962: Chapter 7, *Evolution, Genetics, and Man*, 1961: pp. 325–334; G. H. R. von Koenigswald, *The Evolution of Man*, 1963: pp. 69–70, 86–87, 113–114, 119, 130; Richard Carrington, *A Million Years of Man*, 1963: pp. 49 ff., 76, 79–122; W. E. Le Gros Clark, *History of the Primates*, 1961: pp. 13–20, 46–75, 102–137, 144–158, 168–176; *The Antecedents of*

Man, 1960: pp. 343–349; Ernst Mayr, *Animal Species and Evolution*, 1963: pp. 628–658; L. S. B. Leakey, "The Origin of the Genus Homo," in *Evolution After Darwin*, 1960: Volume II, pp. 17–31; S. L. Washburn and F. Clark Howell, "Human Evolution and Culture," in *ibid.*, pp. 35–53; Cesare Emiliani, "Dating Human Evolution," in *ibid.*, pp. 64–65.

See also L. S. B. Leakey, *Adam's Ancestors*, 1960: Prologue and Chapters I, X–XII; *The Progress and Evolution of Man in Africa*, 1961; Raymond Dart, *Adventures with the Missing Link*, New York, 1959: Chapters II, XI, XIV–XV; Pierre Teilhard de Chardin, *The Appearance of Man*, 1965; W. E. Le Gros Clark, *Man-Apes or Ape-Men?*, 1967.

As this book goes to press, recent fossil finds and much more sensitive methods of dating them give a greater antiquity to both hominid and proto-hominid life on earth. Recent finds in China appear to indicate that *Homo erectus* may go back a million years, and the australopithecines may have existed two million years ago. In addition, very recent discoveries support the possibility that there may be only two species of fossil man—*Homo erectus* and *Homo sapiens*—and that *Homo erectus* may have lived on earth from over one million years ago to as recently as 35,000 years ago, while *Homo sapiens*, to which living man belongs, may date back as far as 500,000 years. See William H. Howells, "Homo Erectus," in *The Scientific American*, Volume 215, No. 5, November, 1966, pp. 46–53.

2. *The Origin of Species and The Descent of Man*, Modern Library edition: p. 541.

3. See Julian Huxley, *Evolution, The Modern Synthesis*, 1942: pp. 569–572; *The Uniqueness of Man*, 1943: Chapter I; *Evolution in Action*, 1953: pp. 103–111; T. Dobzhansky, *Mankind Evolving*, 1962: Chapters 8, 12; G. G. Simpson, *The Meaning of Evolution*, 1949: Chapter XVII; Ernst Mayr, *op. cit.*, pp. 623–624, 650, 656–658; Bernard Rensch, *Evolution Above the Species Level*, 1960: pp. 305–307, 340–341; W. E. Le Gros Clark, *Antecedents of Man*, 1960: pp. 347–349; *History of the Primates*, 1960: pp. 119–120; Richard Carrington, *op. cit.*, pp. 58–59, 62–68; Kenneth P. Oakley, *Man the Tool-Maker*, 1964: pp. 4–5, 125–126, 130, 132; Pierre Teilhard de Chardin, *The Appearance of Man*, 1965: Chapter XVII, *The Phenomenon of Man*, 1959: pp. 164–171, 194–198. See also the papers by Leakey and by Washburn and Howell, in *Evolution After Darwin*, cited in note 1, *supra*.

For a discussion of the significance for human speech of the exclusively human asymmetry of dominance in the cerebral cortex, see Dobzhansky, *Mankind Evolving*, pp. 200–201; Washburn and Howell, *op. cit.*, p. 51; Warren S. McCulloch and Warren M. Brodey, "The Biological Sciences," in *The Great Ideas Today, 1966*, pp. 330–331.

4. See passages cited in note 3, *supra.*

5. For criticism of the interpretation of the South African fossils and artifacts, see von Koenigswald, *op. cit.*, pp. 69–70; Dobzhansky, *Mankind Evolving*, pp. 174–175, 193–194; Le Gros Clark, *History of the Primates*, pp. 102 ff., 118–119; *Man-Apes or Ape-Men?*; Oakley, *op. cit.*, p. 5; Carrington, *op. cit.*, pp. 76, 79; G. G. Simpson, "The Biological Sciences," in *The Great Ideas Today, 1965*; pp. 298–299; Mayr, *op. cit.*, pp. 628–631.

6. See Oakley, *op. cit.*, pp. 4, 125–126; Carrington, *op. cit.*, pp. 64–68; Dobzhansky, *Mankind Evolving*, pp. 208–210, 332, 339; Julian Huxley, *The Uniqueness of Man*, pp. 3–4, 15–16, 27–29; *Evolution in Action*, pp. 107–109; *Evolution, The Modern Synthesis*, pp. 569–572; S. L. Washburn and V. Avis, "Evolution of Human Behavior," in *Behavior and Evolution*, ed. by Simpson and Roe, 1958: pp. 428–435; Le Gros Clark, *Antecedents of Man*, pp. 347–349; *History of the Primates*, pp. 119–120; Dart, *op. cit.*, pp. 216–217, 223–224; Leakey, in *Evolution After Darwin*, Volume II, pp. 28–30; Washburn and Howell, in *ibid.*, pp. 44–46, 49–53; M. Crichtley, in *ibid.*, pp. 296–297, 302–306.

7. *Op. cit.*, p. 283.

8. *Ibid.*, p. 284.

9. *Ibid.*, p. 286.

10. *Ibid.*, pp. 284–285.

11. *Ibid.*, p. 286.

12. *Op. cit.*, p. 624. Cf. *ibid.*, p. 638.

13. *Ibid.*, p. 623.

14. *Ibid.*, pp. 623, 650.

15. *Ibid.*, p. 658.

16. *Mankind Evolving*, p. 203. Cf. *Evolution, Genetics, and Man*, p. 338.

17. *Evolution, Genetics, and Man*, p. 340.

18. *Mankind Evolving*, pp. 208, 210.

19. *Ibid.*, p. 332.

20. *Evolution, Genetics, and Man*, p. 340; *Mankind Evolving*, pp. 210–211.

21. *Evolution, The Modern Synthesis*, p. 556.

22. *The Uniqueness of Man*, pp. 3–5. Cf. pp. 15–32 *passim.*

23. *Evolution in Action*, pp. 107–109.

24. *Evolution, The Modern Synthesis*, pp. 570–571.

25. *Op. cit.*, pp. 305–307.

26. See the references to Washburn and Avis, Washburn and Howell, Oakley, Clark, and Dart, in note 6, *supra.*

27. *Op. cit.*, Chicago, 1964: pp. 227–232.

28. *Op. cit.*, 1927: pp. 266–267. Cf. W. H. Thorpe, *Science, Man and Morals*, 1965: p. 105; W. R. Thompson, "Social Behavior," in *Behavior and Evolution*, p. 293.

29. Oakley, *op. cit.*, pp. 125–126; Carrington, *op. cit.*, pp. 64–65; Mayr, *op. cit.*, pp. 634–635, 650; Rensch, *op. cit.*, pp. 306–307, 340; Dobzhansky, *Mankind Evolving*; pp. 208–210; Julian Huxley, *Evolution in Action*, pp. 103–111; *Evolution, The Modern Synthesis*, pp. 571–572; *The Uniqueness of Man*, p. 3; Le Gros Clark, *History of the Primates*, pp. 119–120; Dart, *op. cit.*, pp. 216–217, 223–224; Washburn and Avis, in *Behavior and Evolution*, pp. 423–425, 435; Washburn and Howell, in *Evolution After Darwin*, Volume II, p. 152.

30. See the references to Oakley, Carrington, Dobzhansky, Julian Huxley, Washburn and Avis, Washburn and Howell, Clark, Leakey, Dart, and Crichtley cited in note 6, *supra.* See also Mayr, *op. cit.*, p. 650; Schaller, *op. cit.*, pp. 224–227; Thorpe, *op. cit.*, p. 69. Cf. Kohler, *op. cit.*, Chapters 4–5.

31. See Dobzhansky, *Mankind Evolving*, p. 339; Julian Huxley, *Evolution in Action*, pp. 110–111; Rensch, *Evolution Above the Species Level*, p. 306; Carrington, *A Million Years of Man*, pp. 62–63; Washburn and Howell, in *Evolution After Darwin*, Volume II, pp. 52–53. Cf. Thompson, "Social Behavior," in *Behavior and Evolution*, pp. 291–308.

32. See Dobzhansky, *Mankind Evolving*, pp. 210–211; *Evolution, Genetics, and Man*, p. 340; Julian Huxley, *Evolution in Action*, pp. 107–108; *The Uniqueness of Man*, p. 4; Mayr, *Animal Species and Evolution*, pp. 624, 656; Rensch, *Evolution Above the Species Level*, pp. 306–307; Simpson, *The Meaning of Evolution*, p. 286; Crichtley, in *Evolution After Darwin*, Volume II, pp. 293–294; Schaller, *The Year of the Gorilla*, pp. 230–231.

33. See Oakley, *Man the Tool-Maker*, p. 126; Dobzhansky, *Mankind Evolving*, p. 218; Carrington, *A Million Years of Man*, pp. 58–59.

34. See Dobzhansky, *Mankind Evolving*, p. 339; Huxley, *Evolution in Action*, pp. 107–108; *Evolution, the Modern Synthesis*, p. 575; Simpson, *The Meaning of Evolution*, p. 290.

35. See Oakley, *op. cit.*, pp. 126–132; Carrington, *op. cit.*, pp. 58–59; Dobzhansky, *Mankind Evolving*, pp. 214, 217–218; Julian Huxley, *Evolution in Action*, pp. 107–108. Cf. Thorpe, *op. cit.*, pp. 89–92. It should be noted that, here and elsewhere, Thorpe fails to distinguish between instinctive performances, on the one hand, and learned performances, on the other. To compare the instinctive behavior of the bower-birds of Australia in decorating their nests, with the non-instinctive decorative behavior of men, is to treat as comparable performances that are incomparable. Hence the behavior of the bower-birds is totally irrelevant to the point here under consideration. For a fuller discussion of this point, see *infra* Chapter 8.

36. See Oakley, *op. cit.*, pp. 4, 125–126; Carrington, *op. cit.*, pp. 67–68; Mayr, *op cit.*, p. 658; Rensch, *op. cit.*, p. 306; Schaller, *op. cit.*, pp. 217, 228–229; Dobzhansky, *Evolution, Genetics, and Man*, pp. 207, 338; Julian Huxley, *Evolution in Action*, pp. 107–109; *The Uniqueness of Man*, p. 3. Cf. John C. Lilly, *Man and Dolphin*, New York, 1961: pp. 256–265; and for passages in a contrary vein, see W. H. Thorpe, *Learning and Instinct in Animals*, 1963: pp. 132–133, 391–393.

37. See Schaller, *op. cit.*, pp. 217, 228–229; Kohler, *op. cit.*, pp. 266–267; Oakley, *op. cit.*, pp. 1–3; Julian Huxley, *Evolution in Action*, pp. 107–108. Cf. Leslie White, "Four Stages in the Evolution of Minding," in *Evolution After Darwin*, Volume II, pp. 239–249.

38. *Evolution in Action*, p. 104.

39. *Ibid.*, p. 109.

40. *Evolution, Genetics, and Man*, p. 338.

41. *Mankind Evolving*, p. 207.

42. *Man the Tool-Maker*, p. 4.

43. Quoted by Schaller in *The Year of the Gorilla*, p. 227.

44. *Evolution Above the Species Level*, p. 306.

45. *Ibid.*, pp. 340–341, 344–345. Cf. *ibid.*, pp. 349–352, in which Rensch makes the principle of continuity in nature the basis for a thorough-going panpsychism, allowing for differences only in degree between lower and higher forms of life. See William James's critique of panpsychism in *The Principles of Psychology*, 1891: Volume I, Chapter VI.

46. *A Million Years of Man*, pp. 64–65, 67–68.

47. See von Koenigswald, *op. cit.*, p. 119; Le Gros Clark, *History of the Primates*, pp. 108, 118, 158; Dobzhansky, *Mankind Evolving*, pp. 175, 177–179, 200–202; Julian Huxley, *Evolution in Action*, pp.

107–109; Mayr, *op. cit.*, 634–637, 652; Rensch, *op. cit.*, 306–307, 332; Washburn and Howell, in *Evolution After Darwin*, Volume II, pp. 50–53; Washburn and Avis, in *Behavior and Evolution*, pp. 424–425; Crichtley, in *Evolution After Darwin*, Volume II, pp. 303–305, 308. Cf. John Lilly, *op. cit.*, pp. 278, 284–285. "Of all animals," wrote Aristotle in the 4th century B.C., "man has the largest brain in proportion to his size" (*Parts of Animals*, II, 7, 653ᵃ28).

NOTES TO CHAPTER 7

1. *Op. cit.*, 1951: p. 6. For a thorough-going critique of the behaviorist position on the distinction between learned and innate behavior, see Konrad Lorenz, *Evolution and the Modification of Behavior*, 1965. Cf. Adolf Portmann, *Animals as Social Beings*, 1964: Chapter 5.

2. See Konrad Lorenz, *King Solomon's Ring*, 1952; W. H. Thorpe, *Learning and Instinct in Animals*, 1963; *Science, Man and Morals*, 1965.

3. Ernest R. Hilgard, "Psychology After Darwin," in *Evolution After Darwin*, 1960: Volume II, p. 270.

4. See *ibid.*

5. See R. H. Waters, "The Historical Background of Comparative Psychology," in *Comparative Psychology*, ed. by F. A. Moss, 1942: pp. 18–29; C. J. Warden, T. N. Jenkins, and L. H. Warner, *Introduction to Comparative Psychology*, 1934: pp. 9–21; Donald Hebb, *A Textbook of Psychology*, 1958: pp. 259–263.

6. *Op. cit.*, p. 3. Cf. Hebb, *The Organization of Behavior, a Neuropsychological Theory*, 1949.

7. *Method and Theory in Experimental Psychology*, 1953: p. 638. Cf. *ibid.*, pp. 655–656, 681.

8. "Levels in the Psychological Capacities of Animals," in *Philosophy for the Future*, ed. by R. W. Sellars, V. J. McGill, and M. Farber, 1949: p. 274.

9. *Op. cit.*, in *Behavior and Evolution*, p. 278. Cf. *ibid.*, p. 282.

10. *The Evolution of Human Nature*, p. 327.

11. See *op. cit.*, p. 279. Cf. *ibid.*, pp. 277–279.

12. See H. F. Harlow, "The Evolution of Learning," in *Behavior and Evolution*, pp. 278–279, 283; "Primate Learning," in *Comparative Psychology*, ed. Calvin Stone, 1955: p. 234; "Thinking," in *Theoretical Foundations of Psychology*, ed. by H. Helson, 1951:

pp. 493–496; Donald Hebb, *A Textbook of Psychology*, 1958, pp. 29–30, 46–48, 188, 206–210, 260–261; Charles E. Osgood, *op. cit.*, Chapter 15 *passim*; Henry W. Nissen, "Axes of Behavioral Comparison," in *Behavior and Evolution*, pp. 193–195; T. C. Schneirla, *op. cit.*, pp. 245, 275–280; N. R. F. Maier and T. C. Schneirla, *Principles of Animal Psychology*, 1935: pp. 469–479; W. T. Heron, "Complex Learning Processes," in *Comparative Psychology*, ed. by F. A. Moss, pp. 265–271–275; John Paul Scott, *Animal Behavior*, 1963; pp. 127–130, 182–184, 219; Robert Leeper, "Cognitive Processes," in *Handbook of Experimental Psychology*, ed. by S. S. Stevens, 1964: pp. 754–755. Other scientists—sociologists, anthropologists, and physiologists—concur in the view held by the comparative psychologists, that man differs only in degree from other animals: see, for example, F. H. Hankins, *Introduction to the Study of Society*, 1928: pp. 56–327; Ralph Linton, *The Study of Man*, 1936: pp. 60, 68, 70; Alexander Goldenweiser, *Anthropology*, 1937: p. 39; A. J. Carlson, "Dynamics of Living Processes," in *Nature of the World and Man*, ed. by H. H. Newman, 1926: pp. 477–479.

13. *Op. cit*, pp. 350–351.

14. *Op. cit.*, p. 326. Cf. *ibid.*, pp. 309, 323–325, 327–329, 358, 360–361, 368, 401–405, 446–448, 453–456. Anyone who reads these pages carefully will end up being utterly perplexed as to just where Professor Herrick stands on the question whether man differs from other animals in kind *as well as* in degree, or *only* in degree.

15. In *Scientific American*, Volume 212, No. 1, January, 1965, pp. 92–100.

16. *Ibid.*, p. 92.

17. *Ibid.*, p. 99.

18. *Ibid.*, p. 97.

19. *Ibid.*, p. 100.

20. See Robert S. Woodworth and Harold Schlosberg, *Experimental Psychology*, 1965: pp. 589–613, 814 ff.; Maier and Schneirla, *op. cit.*, pp. 446–449, 452–453, 455–458, 460, 465, 469–479; Schneirla, *op. cit.*, pp. 275–280; Hebb, *op. cit.*, pp. 29–30, 52–59, 188 ff., 203–205, 260–261; Harlow, in *Behavior and Evolution*, pp. 279 ff.; in *Theoretical Foundations of Psychology*, pp. 457–460, 463, 465, 470; in *Comparative Psychology*, ed. by Stone, pp. 216–217, 228–229, 231–232; Heron, in *Comparative Psychology*, ed. by Moss, pp. 251–254, 257, 271; Heinrich Klüver, *Behavior Mechanisms in Monkeys*, 1961: pp. 326–328, 344–345, 355.

21. *Op. cit.*, p. 283.

22. *Ibid.*, p. 288.

23. For a brief summary of the experimental work and its findings, see Hebb, *A Textbook of Psychology*, pp. 170–177.

24. See Osgood, *op. cit.*, pp. 663–666, 679, 681–682; Schneirla, *op. cit.*, p. 279; Leeper, *op. cit.*, pp. 754–755; Heron, *op. cit.*, pp. 254–257, 271–274; Herrick, *The Evolution of Human Nature*, pp. 401–405; Harlow, in *Behavior and Evolution*, pp. 278, 282; in *Theoretical Foundations of Psychology*, pp. 493–496; in *Comparative Psychology*, pp. 232–234; Henry W. Nissen, "Phylogenetic Comparison," in *Handbook of Experimental Psychology*, pp. 353–354, 376–378, 380; Gregory Razran, "Evolutionary Psychology: Levels of Learning—and Perception and Thinking," in *Scientific Psychology*, ed. by B. B. Wolman and E. Nagel, 1965: pp. 209–219, 233–245.

25. *Op. cit.*, in *Behavior and Evolution*, p. 193.

26. *Ibid.*, p. 195. Cf. Nissen's essay, cited in note 24, *supra.*

27. *A Textbook of Psychology*, p. 211.

28. For a critique of over-simplified stimulus-response formulations, see Osgood, *op. cit.*, pp. 653–656, 663; Hebb, *A Textbook of Psychology*, pp. 46–48, 60–61, 260–263.

29. Hebb, *ibid.*, pp. 209–210.

NOTES TO CHAPTER 8

1. *Politics*, I, 2, 1253^a9–14.

2. *On Interpretation*, Chapters 1–4.

3. *The Uniqueness of Man*, p. 3. As we have noted in Chapter 6 *supra*, the paleoanthropologists and evolutionary biologists, without exception, affirm the proposition that man and man alone has a propositional language or syntactical speech—man and man alone names things and makes sentences. (For textual references on this point, see Chapter 6, note 29.) Agreement on this point extends to the comparative psychologists, the ethologists, the neurologists, and other students of human and animal behavior. See Charles E. Osgood, *Method and Theory in Experimental Psychology*, pp. 681–682; Donald Hebb, *A Textbook of Psychology*, pp. 6, 207–211; Harry Harlow, "The Evolution of Learning," in *Behavior and Evolution*, pp. 278; Henry W. Nissen, "Axes of Behavioral Comparison," in *ibid.*, pp. 193, 195; William R. Thompson, "Social Behavior," in *ibid.*, pp. 293–294; Lawrence Z. Freedman and Anne Roe, "Evolution and Human Behavior," in *ibid.*, p. 462; T. C. Schneirla, "Levels in the Psychological Capacities of Animals," in *Philosophy for the Future*, pp. 275–277, 279; Otto L. Tinklepaugh,

"Social Behavior of Animals," in *Comparative Psychology*, ed. by F. A. Moss, p. 391; John Paul Scott, *Animal Behavior*, Chapter 9; C. Judson Herrick, *The Evolution of Human Nature*, pp. 209, 324–325, 368; George B. Schaller, *The Year of the Gorilla*, pp. 217, 228–229; Konrad Lorenz, *King Solomon's Ring*, pp. 76–78; Henry Nissen, "Phylogenetic Comparison," in *Handbook of Experimental Psychology*, p. 354; W. H. Thorpe, *Learning and Instinct in Animals*, p. 132; John C. Lilly, *Man and Dolphin*, 1961: Appendix Two; K. S. Lashley, "The Problem of Serial Order in Behavior," in *Cerebral Mechanisms in Behavior*, ed. by L. A. Jeffress, 1951: pp. 113–118; Ward C. Halstead, "Brain and Intelligence," in *ibid.*, pp. 255, 259; Lord Russell Brain, *Mind, Perception, and Science*, 1951: pp. 23–30, 38–41; Warren S. McCulloch and Warren M. Brodey, "The Biological Sciences," in *The Great Ideas Today, 1966*, pp. 330–331; Adolph Portmann, *Animals as Social Beings*, pp. 96–97.

4. See Karl von Frisch, *The Dancing Bees*, 1953. For a penetrating commentary on the difference between the instinctive sentence-making of the honey bee and the intelligent sentence-making of man, see Jonathan Bennett, *Rationality*, 1964. If the honey bees were to make the statements that they do make not by instinct, but as a result of learning, calculation, and inference, they would need a brain as large as man's, and would possess a degree of intelligence well above the human average. See also Scott, *op. cit.*, pp. 232–238; T. Dobzhansky, *Mankind Evolving*, pp. 209–210; Julian Huxley, *Evolution in Action*, p. 103.

5. *King Solomon's Ring*, pp. 76–77.

6. See Donald Hebb, *A Textbook of Psychology*, pp. 123–126, and 129–130, esp. p. 126. With regard to the differentiation between innate and learned behavior, see N. Tinbergen, *The Study of Instinct*, Konrad Lorenz, *Evolution and Modification of Behavior*, Adolf Portmann, *op. cit.*, Chapter 5; Irenäus Eibl-Eibesfeldt, "Experimental Criteria for Distinguishing Innate from Culturally Conditioned Behavior," in *Cross-Cultural Understanding*, ed. by F. C. S. Northrop and H. H. Livingston, 1964, pp. 297–307.

7. *Science, Man and Morals*, p. 90.

8. See *ibid.*, pp. 89–92.

9. *Ibid.*, p. 99.

10. *Ibid.*, pp. 101–102. In this context, Thorpe returns to one of his favorite themes—that man differs only in degree from other animals, not in kind. He writes: "We have evidence that animals can use conceptual symbols, but to a limited degree; and that here, as in so many other instances, the difference between the mind of animals and men seems to be one of degree—often the degree of abstraction that can be achieved—rather than one of kind." This, of course,

does not prevent him from writing in a contrary vein in other contexts. In another place in the same book, he says: "I strongly disagree with [C. H.] Waddington's argument that because man evolved as a physical being, he cannot then know any other realms of existence. The animal mind is undoubtedly an efficient instrument for carrying out the essential biological activities; and insofar as man's mind is of the same class of organization, the same thing can be said of the human mind. But I for one should react strongly against any suggestion that we are, let alone must forever remain, in our mental qualities, animals and nothing more" (p. 66). Cf. a similar utterance by Thorpe in his *Learning and Instinct in Animals*, pp. 469–470. See also in this book, pp. 132–133, 175–176; 391–393, 467.

11. Lorenz stresses the fact that the

> "purely innate signal code of an animal species differs fundamentally from human language, every word of which must be learned laboriously by the human child. Moreover, being a genetically fixed character of the species—just as much as any bodily character—this so-called language is, for every individual animal species, ubiquitous in its distribution. Obviously though this fact may seem, it was, nevertheless, with something akin to naive surprise that I heard the jackdaws in northern Russia 'talk' exactly the same, familiar 'dialect' as my birds at home in Altenberg. The superficial similarity between these animal utterances and human language diminishes further as it becomes gradually clear to the observer that the animal, in all these sounds and movements expressing its emotions, has in no way the conscious intention of influencing a fellow-member of its species. This is proved by the fact that even geese or jackdaws reared and kept singly make all these signals as soon as the corresponding mood overtakes them. Under these circumstances the automatic and even mechanical character of these signals becomes strikingly apparent and reveals them as entirely different from human words" (*King Solomon's Ring*, pp. 76–77; see also *ibid.*, pp. 77–91).

In the light of these observations, let us examine once more Thorpe's statement that "although no animal appears to have a language which is (i) propositional, (ii) syntactic, and at the same time (iii) clearly expressive of intention, yet all these features can be found separately (to at least some degree) in the animal kingdom" (roman numerals added). Apart from the dance language of the honey bee, which is purely instinctive and so is utterly incomparable with human language, no evidence is offered to support points (i) and (ii) in the sphere of animal communication; nor is there any evidence for (iii); quite the contrary, according to Lorenz. Hence if having a true language means having a mode of communication

that involves (i), (ii), and (iii), then only man has a true language that is also a learned language, and no aspect of such language is to be found in the animal kingdom as a learned performance.

12. See Osgood, *Method and Theory in Experimental Psychology*, pp. 681–682; Hebb, *A Textbook of Psychology*, pp. 207–209; MacDonald Crichtley, "The Evolution of Man's Capacity for Language," in *Evolution After Darwin*, Volume II, pp. 291–293, 306–307; Leslie A. White, *The Science of Culture*, 1949, pp. 31–33.

13. *King Solomon's Ring*, p. 88. Cf. *ibid.*, pp. 83–88.

14. *Learning and Instinct in Animals*, p. 393. See also his *Science, Man and Morals*, pp. 100–101.

15. See Osgood, *op. cit.*, pp. 681–682; Lorenz, *King Solomon's Ring*, pp. 76–77.

16. See Julian Huxley, *Evolution in Action*, pp. 107–109; *Evolution, The Modern Synthesis*, pp. 570–574; Bernhard Rensch, *Evolution Above the Species Level*, pp. 306–307; pp. 332, 349, 352; Ernst Mayr, *Animal Species and Evolution*, pp. 634–635; T. Dobzhansky, *Mankind Evolving*, pp. 200–202; Washburn and Howell, "Human Evolution and Culture," in *Evolution After Darwin*, Volume II, pp. 50–53; Washburn and Avis, "Evolution of Human Behavior," in *Behavior and Evolution*, pp. 424–425; John Lilly, *Man and Dolphins*, pp. 278, 284–285; MacDonald Crichtley, *op. cit.*, pp. 303–305, 308; M. E. Bitterman, "The Evolution of Intelligence," in *Scientific American*, Volume 212, No. 1, January, 1965, pp. 98, 100; Donald Hebb, A *Textbook of Psychology*, p. 210; Charles E. Osgood, *Method and Theory in Experimental Psychology*, pp. 681–682; C. Judson Herrick, *The Evolution of Human Nature*, pp. 368, 386–387, 431, *The Brains of Rats and Men*, pp. 265–267; K. S. Lashley, "The Problem of Serial Order in Behavior," in *Cerebral Mechanisms in Behavior*, pp. 120–122; Leslie White, *The Science of Culture*, pp. 32–33.

NOTES TO CHAPTER 9

1. For references to relevant passages in the writings of the scientists mentioned, see the notes to Chapters 7 and 8.

2. For references to relevant passages in the writings of some of the scientists mentioned, see the notes to Chapters 6 and 8. In addition, see Kenneth J. W. Craik, *The Nature of Psychology*, 1966: Chapters 6 and 21; *The Nature of Explanation*, 1952: Chapters VI and VII; Jerome S. Bruner, J. J. Goodnow, and G. A. Austin, *A Study of Thinking*, 1956: pp. 9, 231; Earl B. Hunt, *Concept Learning*, 1962:

pp. 5–6; Heinrich Klüver, *Behavior Mechanisms in Monkeys*, pp. 326–328, 344–345; C. Ward Halstead, "Brain and Intelligence," in *Cerebral Mechanisms in Behavior*, pp. 254–255.

3. See Sir Charles Sherrington, *Man on His Nature*, 1941: Chapters XI–XII; W. Macneile Dixon, *The Human Situation*, 1938; Edmund W. Sinnott, *Matter, Mind, and Man*, 1957: Chapters 1, 2, 4, 7, 9, and 17; *The Bridge of Life*, 1966; Roger W. Sperry, "Mind, Brain, and Humanist Values," in *New Views of the Nature of Man*, ed. by John R. Platt, 1965: pp. 71–92; Hans Jonas, *The Phenomenon of Life*, 1966: pp. 108–134; 183–187; Wilder Penfield, "The Physiological Basis of the Mind," in *Control of the Mind*, ed. by Seymour Farber and Roger Wilson, 1961: pp. 3–17. Cf. Theodosius Dobzhansky, *The Biology of Ultimate Concern*, 1967.

4. William James, *Principles of Psychology*, 1891: Volume II, 354 ff.; Ernst Cassirer, *An Essay on Man*, 1944: pp. 25–26, 30, 67–68; Jonathan Bennett, *Rationality*, 1964: pp. 4–6, 90; MacDonald Crichtley, "The Evolution of Man's Capacity for Language," in *Evolution After Darwin*, Volume II, pp. 295, 307–308; Leslie White, *The Science of Culture*, p. 25; Wilfrid Sellars, *Science, Perception and Reality*, 1963: pp. 6–18. Professor Sellars' essay is distinguished from most of the writing in this field by its avowed and explicit aim to treat the question about man as a mixed question—one that requires us to combine common-sense opinion, traditional philosophy, and contemporary science. He takes the position that the traditional philosophical conception of man as different in kind, by virtue of man's exclusive possession of a propositional language and the power of conceptual thought, is indisputably sound; and he then tries to reconcile this view of man with the scientific view that attempts to reduce conceptual thought to neurophysiological processes. Hence, in the end, he interprets man's difference in kind as superficial, not radical.

5. *Reconstruction in Philosophy*, 1920: pp. 1–2. Cf. his *How We Think*, 1910: p. 14.

6. *The Two Sources of Morality and Religion*, 1935.

7. *Thinking and Experience*, 1953: p. 104.

8. *Ibid.*, p. 200. In the context of the passage quoted, Professor Price attributes concepts or abstract ideas to sub-human animals, without recognizing that doing so is manifestly inconsistent with his own distinction between sign-cognition and symbol-cognition, and with his distinction between perceptually-tied and conceptually-free thinking. If animals can respond only to signs, but never to symbols, and if all animal thinking is perceptually tied, whereas human thinking is mediated by symbols and transcends the perceptual environment, then concepts cannot be attributed to both men and sub-

human animals in a strictly univocal sense of that term: for it is man's possession of concepts that enables him to use symbols and to transcend the perceptual environment. The inconsistency results from Price's failure to recognize that he has allowed himself to use the word "concept" in an equivocal manner; it would be removed if, instead of concepts, he were to attribute perceptual abstractions or generalizations to sub-human animals in order to explain their sign-thinking. He seems to be aware of the distinction between perceptual abstraction (or generalization) and concept-formation (see pp. 43, 52–54, 73), but he also erroneously supposes that concept-formation is an abstractive process in the same way that perceptual generalization is, and this leads him to identify concepts with "abstract ideas." See Peter Geach, *Mental Acts*, 1957: pp. 18–44.

Other writers who distinguish between sign and symbol, attributing the latter exclusively to man, also make the error of attributing concepts to sub-human animals, even though doing so is inconsistent with their understanding of conceptual thought as inseparable from the use of symbols. See Leslie White, *The Science of Culture*, pp. 44–45; cf. *ibid.*, pp. 25–27, 30–31. See also his essay "Four Stages in The Evolution of Minding," in *Evolution After Darwin*, Volume II, esp. pp. 249–250. In the same volume, see the essay by MacDonald Crichtley, in which he says that the facts no longer justify us in restricting conceptual or abstract thinking to man alone (p. 299), though a little earlier he says that with the advent of human speech we have "the earliest mastery over purely perceptual thinking, the dawn of conceptual thought, and release from the shackles of time-present" (p. 297). In both White and Crichtley, as in Price, the root of the trouble lies in unclarity concerning the difference between perceptual abstraction and concept-formation. This subject is treated at length in Chapter 10.

9. See *op. cit.*, pp. 79–80, 85–86, 97–98.

10. See *op. cit.*, pp. 25–26, 41. Cf. *ibid.*, pp. 27–31. See also Erich Kahler, *Man the Measure*, 1943: pp. 7, 10, 14–16; Michael Polanyi, *The Study of Man*, 1963: pp. 59–69.

11. I have a number of reasons for electing to use the phrase "conceptual thought" for the intellectual power that is distinctive of man. In the first place, conceptual as distinct from perceptual thought is not limited to the temporally and physically present environment; and so the word "conceptual" connotes the autonomy of distinctively human thought—its independence or transcendence of the perceptual present. In the second place, the use of the term reminds us that human concept-formation must always be differentiated from perceptual abstraction or generalization in sub-human animals. In the third place, since concepts are exercised in acts of judgment and in processes of reasoning, the term "conceptual" has a connotation that includes "rational." And finally, if by "symbolic

thought" is meant that which is verbally expressed, then conceptual thought is broader in its connotation, for it covers not only that which is verbally expressed, but also that which can be but is not.

12. See *op. cit.*, Chapters VII–XII.

13. See Sellars, *op. cit.*, p. 6; Crichtley, *op cit.*, pp. 302–304; White, *The Science of Culture*, p. 32.

14. James, *op. cit.*, Volume II, p. 356; White, *op. cit.*, pp. 25, 29. Cf. Price, *op. cit.*, pp. 173, 180–181.

15. White, *op. cit.*, pp. 25–29; cf. his essay in *Evolution After Darwin*, Volume II, pp. 249–250; Crichtley, in *ibid.*, pp. 293, 300. If White's handling of the distinction between sign and symbol had had greater precision and clarity, it might have prevented the misunderstanding of his thesis by Herrick in his *The Evolution of Human Nature*, pp. 326, 329. Herrick's own position on this matter is equally unclear and self-refuting; see *ibid.*, pp. 401–405.

16. *Op. cit.*, p. 29.

17. *Ibid.*, p. 32.

18. See *op. cit.*, pp. 144–145, 160–161, 213–214, 231–233.

19. See *ibid.*, pp. 180–233. For the substance of Price's own theory of meaning, and for his understanding of the relation between concepts and symbols, see *ibid.*, pp. 298–358. Here he is much closer to Geach's analysis of concept-formation: see the latter's *Mental Acts*, pp. 11–17. For critiques of both Price and Geach from the viewpoint of more behavioristic philosophies, see A. J. Ayer, *Thinking and Meaning*, 1947: pp. 23–25. Ayer sides with Gilbert Ryle against Price, and so does G. J. Warnock in his essay "Logical Analysis and the Nature of Thought," in *Scientific Psychology*, pp. 474–487. On the other hand, for a penetrating critique of Ryle's *The Concept of Mind*, see C. A. Campbell's essay "Ryle on the Intellect" in *Clarity Is Not Enough*, ed. by H. D. Lewis, 1963: pp. 278–310.

20. *Conjectures and Refutations*, 1962: p. 295. Cf. Bennett, *Rationality*, pp. 56, 79, 82–83.

21. *Op. cit.*, Chapters XII and XXII.

22. See *op. cit.*, pp. 18–44, 130–131. For Geach's critique of the experimental work done on animals that claims to find concept-formation in rats in virtue of their being able to discriminate perceptually between squares and triangles, or between reds and blues, see *ibid.*, pp. 16–17, 42–44. Geach is not alone in his criticism of this misinterpretation of the experimental data: see Klüver, *op. cit.*, pp. 326–328, 344–345; Maier and Schneirla, *Principles of Animal Psychology*, pp. 455–458.

23. See *op. cit.*, pp. 56, 79–80, 82–83, 89–90, 104–112. Professor J. J. C. Smart takes a diametrically opposed view of reasons *versus* causes (or *because* as distinct from *cause*); see his *Philosophy and Scientific Realism*, pp. 126–130.

24. The following authors clearly assert that conceptual thought is the indispensable pre-requisite of propositional speech: Ernst Mayr, *Animal Species and Evolution*, p. 658; George Schaller, *The Year of the Gorilla*, p. 217, 228–229; Richard Carrington, *A Million Years of Man*, pp. 67–68.

The following clearly assert that man's propositional speech explains his power of conceptual thought: Bernhard Rensch, *Evolution Above the Species Level*, pp. 306–307; Harry Harlow, in *Behavior and Evolution*, pp. 278, 282; and in *Theoretical Foundations of Psychology*, pp. 493–496.

And the following authors appear to make both of the foregoing assertions, without attempting to reconcile them: T. Dobzhansky, *Mankind Evolving*, p. 207 versus *Evolution, Genetics, and Man*, p. 338; Donald Hebb, *A Textbook of Psychology*, pp. 29–30, 46–48 versus 207–209, 211; Julian Huxley, *Evolution in Action*, 107–109, esp. 109 versus *The Uniqueness of Man*, p. 3, 15.

25. See Geach, *op. cit.*, pp. 13, 44; Price, *Thinking and Experience*, pp. 305–311, 316–319. Cf. *Cerebral Mechanisms in Behavior*, ed. by L. A. Jeffress, pp. 112–133, 116–118, 120–122, 182–193, 259.

26. See Bennett, *op. cit.*, pp. 46–47, 86–87, 93–96. Cf. Geach, *op. cit.*, p. 18. With regard to the separability of words and concepts and the *priority* of concepts or intentions, see Roderick Chisholm in *Minnesota Studies in the Philosophy of Science*, 1958: Volume II, Appendix, pp. 532–533.

NOTES TO CHAPTER 10

1. Psychologists tend to use the words "stimulus" and "response" with maximum ambiguity. On the one hand, they use "stimulus" as physiologists and neurologists use the term: for the physical factor that activates a receptor. On the other hand, they use the term loosely for any *perceived or sensible object*; e.g., they speak of food or of a dangerous situation as a stimulus. Similarly, they use the word "response" as physiologists and neurologists do, to name the activation of specific effectors (muscles or glands); but they more frequently use "response" for any kind of action, and their naming of it often includes their interpretation of the purpose of the action, as when they speak of a "flight response," or a "fighting response," or a "food-seeking response." This loose use of the terms

"stimulus" and "response" permits them to cover much ground illicitly, and to conceal the psychological barrenness of strict S-R formulations. It allows them to think that they are being scientific and objective in ways that they are not.

2. I am indebted to Professor Wilfrid Sellars for the distinction between methodological and metaphysical, or what he calls "philosophical," behaviorism. See *Science, Perception and Reality*, pp. 22–25, 183–185.

3. For Aristotle, and for Aquinas who follows him in this regard, our knowledge of an animal's powers or abilities, its habits or dispositions, can be learned only from observation of its actions or operations. The same rule applies to our knowledge of man. It is only by observing what a man does that we obtain the data from which we are able to infer what, by innate ability, he can do or what, by acquired habit, he is disposed to do. See, for example, *Summa Theologica*, I, 77, 3; *ibid.*, I, 87, 2.

4. Thus, for example, Donald Hebb writes: "There are two theories of mind, speaking very generally. One is animistic, a theory that the body is inhabited by an entity—the mind or soul—that is quite different from it, having nothing in common with bodily processes. The second theory is physiological or mechanistic; it assumes that mind is a bodily process, an activity of the brain. Modern psychology works with this latter theory only. Both are intellectually respectable (that is, each has support from highly intelligent people, including scientists), and there is certainly no decisive means available of proving one to be right, the other wrong" (*A Textbook of Psychology*, p. 3). Cf. *ibid.*, pp. 260–262. See also Charles E. Osgood, *Method and Theory in Experimental Psychology*: "The term 'thought,' as it is used in everyday language, connotes vague, immaterial stuff, activity that takes place in the brain but is not strictly part of it. It falls in the same category as ideas and images, mentalistic constructs that Watson, as an early and forceful behaviorist, ejected from psychological science as 'ghosts.' Although we cannot deny that some processes warranting these labels exist, we must follow Watson in denying that they partake of something other than the material world. *Otherwise we should be unable to investigate them at all with scientific methods*" (p. 638, italics added). Cf. *ibid.*, pp. 680–681.

5. *A Textbook of Psychology*, p. 203.

6. See N. Tinbergen, *The Study of Instinct*, pp. 160–184; Konrad Lorenz, *King Solomon's Ring*, pp. 120–180; *On Aggression*, pp. 85–108; W. H. Thorpe, *Learning and Instinct in Animals*, pp. 404–437, 449–466. As used in the pages just cited, the terms "instinct" and

"instinctive" do not refer to observable behavior, but rather stand for a theoretical construct that is needed to explain behavior that is both unlearned and species-predictable. Thus, when an animal, without prior perceptual experience, recognizes another animal either as a hostile predator or as a member of its own species, it is exercising a perceptual abstraction that cannot be a perceptual attainment, and can only be explained as an innate or instinctive perceptual endowment that is common to all members of the species. Such instinctive perceptual recognitions in animals are the analogue of what were once thought to be innate ideas in man. The denial of innate ideas in man is tantamount to the denial that man has any perceptual abstractions or conceptual dispositions that are *innate endowments*; they are all *attainments*.

7. *Behavior Mechanisms in Monkeys*, pp. 4–10, 19–25, 326 ff.

8. The error of supposing that percepts and concepts are themselves knowable objects or inspectable occurrents in experience is pervasive in modern psychology from the seventeenth century on. When H. H. Price criticizes this error and calls it the "classical theory" of concepts, he obviously refers to its seventeenth century origins with Descartes and Locke (see *Thinking and Experience*, pp. 320–335; cf. *ibid.*, pp. 247–250, 260–263, 276–277, 301–304). It is not "classical" at all if that word is understood as referring to ancient and mediaeval thought, especially that of Aristotle and Aquinas. The theory of perceptual abstractions and concepts not as inspectable occurrents, but as functioning dispositions—not as objects which we know, but only as that by which we are able to know—is the ancient and truly classical theory, lately revived by Ryle, Price, and others without acknowledging its ancient lineage. For a comprehensive exposition of this theory of percepts and concepts as always the *id quo*, never the *id quod*, of knowing, see Jacques Maritain, *Les Degrés du Savoir*, 1932: pp. 769–819. The reader will find an adaptation of this analysis in Chapter 12, note 41, *infra*. He is also referred to my discussion of this point in *The Conditions of Philosophy*, pp. 266–270, where I indicate the serious consequences in modern thought that flow from the error made by Descartes and Locke.

Credit for the revival of the ancient theory must be given, in part at least, to the behavioristic psychologists from John B. Watson on, who, in the face of a long tradition of scientific opinion to the contrary, with admirable persistence denied that one can look into his own mind introspectively and find there any directly observable entities, such as percepts, images, concepts, or ideas. Unfortunately, some of them went further and converted this denial—the denial that what their predecessors in modern psychology had supposed to be the observable contents of the mind *existed as observable* (i.e., *introspectable*) *occurrents* in experience—into a denial that such things as percepts, images, or concepts *exist at all*. They failed to

see that such things may exist as functioning dispositions, even though they do not exist as inspectable occurrents.

9. In *Thinking and Experience*, Professor Price quotes with approval Aristotle's account of the genesis of those concepts that are formed on the basis of perceptual abstractions, but he fails to see that not all our concepts are thus formed, and that even those which arise in this way are not formed by an abstractive process. The passage quoted is the famous one in Book II, Chapter 19, of the *Posterior Analytics*: "Though sense-perception is innate in all animals, in some the sense-impression comes to persist, in others it does not. So animals in which this persistence does not come to be either have no knowledge at all outside the act of perceiving, or no knowledge of objects of which no impression persists; animals in which it does come into being have perception and can continue to retain the sense-impression in the soul; and when such persistence is frequently repeated a further distinction arises between those which out of the persistence of such sense-impressions develop a power of systematizing them and those which do not. So out of sense-perception comes to be what we call memory, and out of frequently repeated memories of the same thing develops experience; for a number of memories constitute a single experience. From experience again—i.e., from the universal now stabilized in its entirety within the soul, the one beside the many which is a single identity within them all —originate the skill of the craftsman and the knowledge of the man of science" (99^b36–100^a8).

My interpretation of this passage is somewhat different from that offered by Price. Translated into modern idiom, the passage describes the process by which perceptual abstractions or generalizations develop from the residues or memory of repeated perceptions. What Aristotle calls the "single experience" in which the "universal" is "stabilized" is what I have called a "perceptual abstraction"—the acquired disposition to recognize a number of perceptible object as being the same or sufficiently similar in kind; thus, from many acts of perceiving dogs—this dog, and that dog, and that—develops, by an abstractive process, a generalized memory of dogs, and from this memory the power or disposition to perceive this animal, that animal, and that, as the same in kind. The "universal" to which Aristotle refers is not the one we have in mind when we understand conceptually what it is like to be a dog, but only the generalization that is implicit in our memory of dogs and in our perceptual discrimination between animals that are dogs and animals that are not dogs. When we form the concept of dog, we make that implicit universal explicit in our understanding of the kind of thing a dog is; but though the concept we form is *based* on our experience of dogs, we do not abstract it from that experience; we do not abstract if from our generalized memory of dogs or from our ability to discriminate between dogs and non-dogs. Cf. Price, *op. cit.*, pp. 60–61; also pp. 35, 43, 52–53, 56, 73, and 341–358; and

see Peter Geach's argument against the identification of concept-formation with the process of abstraction—the kind of process that occurs in perceptual generalization and discrimination—in *Mental Acts*, pp. 18–44, 130–131.

10. See N. R. F. Maier and T. C. Schneirla, *Principles of Animal Psychology*, pp. 446–453; and R. S. Woodworth and H. Schlosberg, *Experimental Psychology*, pp. 589–613.

11. See Hebb, *A Textbook of Psychology*, pp. 204–205; Ernest R. Hilgard, "Methods and Procedures in the Study of Learning," in *Handbook of Experiemntal Psychology*, ed. by S. S. Stevens, p. 523.

12. See Hebb, *ibid.*, pp. 46–48, 52–58, 203–206, 260–263; Osgood, *op. cit.*, 638–639, 653–665.

13. See Hebb and Osgood as cited in note 12, *supra*; see also Harry Harlow, "Primate Learning," in *Comparative Psychology*, ed. by C. P. Stone, pp. 228–231; and his "Thinking," in *Theoretical Foundations of Psychology*, ed. by H. Helson, pp. 457–468. Cf. Jonathan Bennett, *Rationality*, pp. 88–89, 101–114.

14. Cf. Maier and Schneirla, *op. cit.*, pp. 452–453.

15. See Woodworth and Schlosberg, *op cit.*, pp. 576–601; Harry Harlow, "Primate Learning," in *Comparative Psychology*, ed. by Stone, pp. 183–235; "Thinking," in *Theoretical Foundations of Psychology*, ed. by Helson, pp. 469–476, 487–497; "The Evolution of Learning," in *Behavior and Evolution*, ed. by Roe and Simpson, 1958: pp. 279–283; K. U. Smith, "Discriminative Behavior in Animals," in *Compartive Psychology*, ed. by Stone, pp. 316–361; W. T. Heron, "Complex Learning Processes," in *Comparative Psychology*, ed. by F. A. Moss, pp. 267–274; Hebb, *A Textbook of Psychology*, pp. 29–30, 188–191; Maier and Schneirla, *op. cit.*, pp. 455–460; Klüver, *op. cit.*, pp. 326–329, 344–349.

16. The title of the essay by Warren S. McCulloch and W. Pitts is revealing: "How We Know Universals: The Perception of Auditory and Visual Forms" (in a collection of McCulloch's essays entitled *Embodiments of Mind*, 1965). The second part of the title, following the colon, indicates that the so-called "universals," the knowledge of which the authors are attempting to explain neurologically, are merely perceptible forms or shapes, auditory or visual, and hence the universals referred to are the generalizations implicit in perceptual abstractions, not the explicit universals that are apprehended in conceptual cognition. See note 9, *supra*. It is perfectly plain, from all the evidence offered, that perceptual abstraction and not concept-formation is the psychological counterpart of the theoretical construct employed by neurologists to explain the perception of shapes and the recognition of other patterns by animals and

by machines. If there are memory residues of perceptual abstractions, these should be called "mnemonic or imaginative abstractions," for the generalized memory-image is nothing but a residue of the generalized perception. Cf. Kenneth J. W. Craik, *The Nature of Explanation*, pp. 69–73.

17. See Harlow, Hebb, and Heron as cited in note 15, *supra*. In addition, see Osgood, *op. cit.*, pp. 655–672; Henry W. Nissen, "Axes of Behavioral Comparison," in *Behavior and Evolution*, ed. by Roe and Simpson, pp. 193–195; C. Judson Herrick, *The Evolution of Human Nature*, pp. 360–361, 402–403, 444–445; W. H. Thorpe, *Learning and Instinct in Animals*, pp. 132, 385–394.

18. See Maier and Schneirla, *op. cit.*, pp. 455–460; Klüver, *op. cit.*, pp. 326–328, 344–349; J. P. Scott, *Animal Behavior*, 1958: pp. 113–114; Konrad Lorenz, *King Solomon's Ring*, pp. 84–89; K. S. Lashley, "The Problem of Serial Order in Behavior," in *Cerebral Mechanisms in Behavior*, ed. by L. A. Jeffress, pp. 112–116, 118–120. Lashley points out that understanding what is the same in two inter-translatable sentences is quite different from recognizing a series of A's as the same letter: what is perceived as common to a series of different A's cannot be compared with the cognition of the same meaning in a German and an English sentence. The one is accomplished by a perceptual abstraction; the other requires conceptual thought. Lashley's point is that the conceptual universal is grasped quite apart from any sensible sameness whatsoever; whereas there is always a sensible sameness in the case of perceptual abstractions, and so they are not true universals. The same point is made by Peter Geach in the following passage:

> "Many psychologists, wishing to use the term 'concept' far more widely than I do . . . would say that an animal has acquired a concept if it has learned a discriminative response to some feature of its environment. If a rat or dog is trained to react in a certain way whenever it has a triangle shown to it (rather than some other shape), then they would say it has acquired a concept of *triangle*. . . . What is at issue here is not just the way the term 'concept' is to be used, but the desirability of comparing these achievements of rats and dogs with the performances of human beings who possess a concept of *triangle*; the psychologists I am criticizing want to play down the differences between human and animal performances, and I want to stress them. The life of brutes lacks so much that is integral to human life that it can only be misleading to say that they have concepts like us—as misleading as it would be to say that men have tails and women lay eggs . . . or to call the noises made by brutes 'language.' Experience in training dogs to 'recognize' triangles can be no guide in (let us say) teaching geometry" (*Mental Acts*, p. 17).

19. See Chapter 11, note 13 for a more explicit statement on this point, after it has been shown that we must attribute conceptual thought to man in order to explain his linguistic behavior.

NOTES TO CHAPTER 11

1. See Charles E. Osgood, *Method and Theory in Experimental Psychology*, pp. 655–665, 681–682; Donald Hebb, *A Textbook of Psychology*, pp. 46–48, 260–263; Harry Harlow, "Thinking," in *Theoretical Foundations of Psychology*, ed. by H. Helson, pp. 493–496; C. Judson Herrick, *The Evolution of Human Nature*, pp. 324–326, 329, 360–361, 401–405. The foregoing writers all use the one word "symbol" for signs that are merely signals, on the one hand, and for signs that are designators, on the other. The following writers distinguish between signals and designators, but they use the word "symbol" for designators, and the word "sign" for signals: MacDonald Crichtley, "The Evolution of Man's Capacity for Language," in *Evolution After Darwin*, Volume II, pp. 300–301; Leslie A. White, *The Science of Culture*, pp. 26–29; Ernst Cassirer, *An Essay on Man*, pp. 31–32. Much misunderstanding results from these divergent uses of the word "symbol"; see, for example, Herrick's misunderstanding of White, p. 401 of his book, cited above.

2. When I use the word "name" or speak of "naming," I always have in mind what is ordinarily called a common or general name, never a proper name, i.e., a common noun, such as "dog" or "mammal," *not a proper name or definite description that designates one and only one object*, such as "George Washington, the first President of the United States." As any student of modern logic knows, the meaning or significance of common names is much easier to explain than that of proper names or definite descriptions. Karl Popper seems to hold the contrary view, that the use of proper names is "by far the simplest case of a descriptive use of words." See *Conjectures and Refutations*, pp. 297–298. Cf. H. H. Price, *Thinking and Experience*, pp. 281–283.

3. See *Prior Analytics*, II, 27; *Posterior Analytics*, I, 6, $75^{a}28$–35; *Rhetoric*, I 2, $1357^{a}23$–$1357^{b}24$. Aristotle is concerned with inference, but what he calls a sign is identical with what I have called a signal; in fact, he uses the same illustrations: clouds are a fallible sign of rain; smoke, a fallible sign of fire. For an interesting variety of examples of signs that function as signals, see Price, *Thinking and Experience*, p. 106 ff.

4. This obvious fact is overlooked and transgressed by the behavioristic theory of the meaning of signs that function as signals. That theory makes the actual response or the disposition to respond that

is elicited by a signal or cue (and it treats the words used in human language as if they were nothing but signals or cues) the constitutive source of the signal's meaning. See note 5, *infra*, for a critique of the bankruptcy of behaviorism when it comes to the problem of accounting for the meaning of signs, either signals or designators.

5. Anyone who understands the analysis here given of the implicative meaning of signals and the denotative-connotative meaning of designators should be able to discern the utter speciousness of the stimulus-response theory of signs and their meaning. For prime examples of the theory in question, see Charles Morris, *Signs, Language and Behavior*, 1946; *Signification and Significance*, 1964; B. F. Skinner, *Verbal Behavior*, 1957; Charles E. Osgood, *Method and Theory in Experimental Psychology*, pp. 690–699; C. E. Osgood, G. Suci, and P. Tannenbaum, "The Logic of Semantic Differentiation," in *Psycholinguistics*, ed. by S. Saporta, 1961: pp. 286–289.

It must be remembered that the S-R theory is offered as an account of verbal signs in human linguistic behavior, and not merely as an explanation of the functioning of non-verbal signs in the behavior of non-linguistic animals. On the very face of it, it is apparent that the S-R formulation cannot account for the meaning of designators, since it claims that a word which elicits a particular response gets its meaning from the stimulus (*the perceived object*) to which that response is made or which arouses a disposition to respond in certain ways. This amounts to saying that a word naming an object gets its designative meaning from that *object-as-perceived*. As Section 5 of this chapter will clearly show, the designative significance of names cannot be thus explained.

The analysis presented in Section 4 will reveal that the S-R theory is equally befuddled in its attempt to explain the implicative or if-then meaning of signals *in human behavior*. Here the central error consists in deriving the meaning of the signal from the response or disposition to respond to which it gives rise instead of recognizing that the response is itself determined by the apprehended meaning of the signal. The fact that the same signal with the same meaning can give rise to opposite responses and to quite contingent and variable ones shows that these responses are a consequence of, not a source of, the signal's meaning. The picture presented by the S-R theory of signs in human behavior is a fictitious concoction that does not even have the relevance of a false scientific theory.

Professor Price's criticism of the behavioristic formulation centers on the point that it attempts to treat all signs (including designators) as if they were signals (see *Thinking and Experience*, pp. 185–187, 191, 194, 197–201). He refers to it as "the signal theory of meaning." Professor Price's criticism does not go far enough. The defect in the behavioristic or S-R theory is not only that it cannot explain the meaning of designators, but also that it is irrelevant to the way in which signals function in human behavior. On the other hand,

the S-R formulation may go a long way toward accounting for the functioning of cues in animal behavior. (These cues may be verbal or non-verbal; but when they are verbal, they do not have the meanings that words have, either as designators or as signals.) Learned cues that, through conditioning, become operative as substitute stimuli function *meaninglessly*; that is, without any prior apprehension of the meaning of the signal on the part of the animal responding to the cue. If this is so, then in the behavior of non-linguistic animals, no signs at all—not even signals, much less designators—are operative; for if a sign is *always meaningful*, then the word "signal" is being used equivocally when it is used, on the one hand, for the *meaningless* cues that function in animal behavior and, on the other hand, for the *meaningful* signals, verbal or non-verbal, that function in human behavior. What I am saying, in short, is that, to whatever extent S–R formulations account for cue-functioning in animal behavior, they do so without any reference to meaning or significance; hence, these same formulations cannot account for the functioning of signs (signals or designators) in human behavior, because here the apprehension of meaning must be taken into account, which is precisely what the S-R formulations cannot do.

6. Cf. Price, *Thinking and Experience*, pp. 160–164, 213–214, 231–233.

7. See the references given in Chapter 10, note 17.

8. Professor Price, as already pointed out, erroneously supposes that concepts must be attributed to non-linguistic animals in order to explain their reactions to signals (see *Thinking and Experience*, pp. 90–94, 98, 103–104, 200–203). He would be mistaken even if the signals that function in animal behavior operated meaningfully, for the attainment of perceptual memories and abstractions would suffice to explain the apprehension of the generalized significance of signals. Concept-formation by non-linguistic animals would not have to be posited. See *supra*, Chapter 9, note 8, and cf. Chapter 10, note 9. But Professor Price is even more fundamentally in error if the learned cues that function in animal behavior operate meaninglessly, and so can be explained entirely in S-R terms and by reference to conditioning (see note 5, *supra*).

9. Cf. Price, *Thinking and Experience*, pp. 214–233, 268, 273–274. I cannot stress too much the point that the linked denotative and connotative meanings of a designator do not derive from a single concept, but from a whole set of related concepts. This point, it seems to me, is related to the point that Geach is making when he maintains that no one knows the designative meaning of a naming-word unless he can use it meaningfully in a sentence. As thus used, the single word's meaning involves a whole set of concepts—the set of concepts that confer meaning upon the sentence (see *Mental Acts*, pp. 11–16).

10. The triadic theory of the significance or meaning of words (more specifically, of names, or signs that are designators) was first stated by Aristotle in two sentences in the opening chapter of his treatise *On Interpretation* (16ª3–8). Both because of its brevity and because Aristotle was not concerned with the problem of meaning as later generations have come to face it, the statement is obscure and has been subject to misunderstanding. It is clear with regard to the three distinct elements that are involved (the verbal sign, the things that we use language to talk about, and our understanding or knowledge of these things); but it is imprecise about the relation of these three elements. The theory, as stated by Aristotle, simply points out that we cannot use words to talk about things of which we have no knowledge or undersanding at all; and so the significance of our words, when we do talk about things that we know or understand, involves our knowledge or understanding of those things. In sharp contrast to this triadic theory of meaning are a variety of dyadic theories that, in one way or another, try to explain the significance of names or designators without employing, as the pivotal element in the explanation, our knowledge or understanding of the things signified. It is my contention that all dyadic theories fail to solve the problem or, worse, fail to understand the problem for which they are offered as solutions. But I am not saying that all triadic theories succeed in solving the problem. There is a correct and an incorrect version of the triadic theory. The incorrect version of it, which had its origin in Locke, committed a fundamental error that not only prevented it from solving the problem, but also resulted in the rejection of the triadic theory itself and led to the effort to substitute one or another dyadic theory for it.

Only within the general context of a correct theory of knowledge can we find a correct statement of the triadic theory. Only when the concept is treated (as in Aristotle and Aquinas) as *that by which* we know or understand (*id quo*), never as *that which* we know or understand (*id quod*), does the correct version of the triadic theory result: the object known or understood is that which our designative words signify; the object as understood is that which is signified. Since our concepts are that by which we understand the objects we know, they are also that by which our words signify those objects as known; they are themselves never the objects signified.

Unfortunately, even in the correct version, the triadic theory has often been stated in a way that leads to misunderstanding. Not only are there three distinct elements in the theory (the verbal sign, the concept, and the significate or object signified); but there are also three distinct relations involved: (i) the relation, R_1, between verbal sign and concept; (ii) the relation, R_2, between concept and object understood; and (iii) the relation, R_3, between the verbal sign and the object signified as understood. In traditional statements of the correct version of the triadic theory, one word has often

been used to name all three relations; thus, it is said that the verbal sign *signifies* the concept, that the concept *signifies* the object known, and that the verbal sign *signifies* the object as known. The philosophers who made such statements were not led into error by this triple use of the word "signifies" because within the general context of their theory of the concept as *id quo*, never *id quod*, they used that one word in quite distinct senses when they used it to relate the verbal sign to the concept, the concept to the object known, and the verbal sign to the object as known. They recognized that the verbal sign signifies the object-as-known through the medium of the concept as that by which the object known is understood. See, for example, Aquinas, *Summa Theologica*, I, 13, 1.

To prevent misunderstanding by contemporary readers who are not habituated to the distinction between *id quo* and *id quod*, I propose to use three distinct words to name the three distinct relations involved in the correct version of the triadic theory of meaning. I reserve the word "signifies" or "means" for the relation, R_3, between the verbal sign and its significate, the object signified. For the relation, R_1, between the verbal sign and the concept, I will use the word "evokes." And for the relation, R_2, between the concept of an object and the object understood, I will use the word "represents" or "makes known." Thus, the verbal sign "dog" evokes (R_1) the concept *dog*, which represents or makes known (R_2) the animal dog, and through the functioning of these two relations, the verbal sign "dog" signifies (R_3) the animal dog. When we say that the meaningless sound or mark becomes the meaningful name "dog" we are saying that it has acquired, through linkage with the concept *dog*, the power to evoke that concept and, through it, to signify the animal dog that is understood and made known by the concept *dog*. And when we say that the mark or sound "dog" *has thus acquired* the meaning which makes it a designative sign or name, and that the concept of dogs *is* the meaning that it has acquired, we must observe that, in using the word "meaning" itself twice, we have used it in two distinct ways. A current distinction between sense and reference helps us to clarify this point. The meaning which *is* the concept *dog* is the sense of the word "dog." The meaning which the word "dog" *has*, through evoking the concept by which the object is understood, is the reference of the word "dog"; i.e., the significate or object signified is its referent. Hence when we speak of the meaning of the word "dog," we must always distinguish its sense (meaning_1) and its reference (meaning_2). And when we say that concepts *are* meanings, whereas verbal signs only *have* meanings, we must always be clear that concepts *as* meanings give sense to our words, but are never its referents; and that the meaning which our words *have* is always twofold—their sense, on the one hand, and their reference, on the other..

I said earlier that the incorrect version of the triadic theory originated with John Locke. It does so in the context of a theory of

knowledge and ideas that makes ideas the objects (*id quod*) of the mind when the mind thinks. Hence when Locke comes to explain the meaning that words *acquire* and *have*, he cannot help but make ideas the objects that they signify—their significates or referents. "Words, in their primary or immediate signification," Locke writes, "stand for nothing but the ideas in the mind of him that uses them" (*Essay Concerning Human Understanding*, Book III, Chapter ii, Section 2). Cf. *ibid.*, Section 5. The distinction between sense and reference is lost; ideas or concepts are no longer treated as the medium through which words signify things known or understood, thus giving a word the sense by which it is able to refer to a thing. When the triadic theory of meaning is mentioned—and either embraced or rejected—by twentieth-century writers, it is always the incorrect Lockean version, never the correct Aristotelian version, of the theory that they have in mind. See C. K. Ogden and I. A. Richards, *The Meaning of Meaning*, 1923: pp. 49 ff.; Stephen Ullmann, *The Principles of Semantics*, 1963: pp. 71–72; N. E. Christensen, "A Proof That Meanings Are Neither Ideas Nor Concepts," in *Analysis*, Volume XVII, No. 1, October, 1956, pp. 10–13. Christensen's proof that words do not signify concepts or ideas amounts to no more than a showing that concepts are not the referents or significates of verbal signs, which is precisely what the correct version of the triadic theory maintains. Only the incorrect version makes the mistake against which Christensen argues; he does not seem to be aware of the Aristotelian version of the theory.

The Institute for Philosophical Research is currently engaged in the study of the whole discussion of language and thought and especially the problem of meaning. We have examined most of the major twentieth-century treatments of this subject. We have found only two contemporary writers who indicate some awareness of the correct version of the triadic theory of meaning: J. N. Findlay (see "Use, Usage, and Meaning," in *Clarity Is Not Enough*, pp. 429–441, esp. pp. 440–441); and R. Chisholm (see the reference to him in note 11, *infra*). Others among contemporaries who comment on the triadic theory are either unacquainted with the Aristotelian version or so misunderstand it that they treat that version and the Lockean version as if they were identical, e.g., Ogden and Richards and those who have criticized Ogden and Richards. The rest manifest no awareness at all of the triadic theory in its correct version and, in addition, do not seem to understand the problem that it tried to solve and succeeded in solving.

Professor Findlay's article, cited above, first appeared as a reply to a paper presented by Gilbert Ryle in an Aristotelian Society Symposium on meaning and use (see *Proceedings of the Aristotelian Society*, Supplementary Volume XXXV, 1961: pp. 223–230). Findlay clearly showed the inadequacy of the Wittgensteinian theory that the meaning of words in ordinary language is *nothing but* their use. That theory is, in its own terms, unable to explain how origi-

nally meaningless marks or sounds acquire meaning; rules of usage or conventions of use cannot adequately explain this, for the role they play needs to be explained; and as Findlay points out, the explanation presupposes the existence of meanings as intentions of the mind. (Compare Findlay's criticism of the theory that meaning is use with the criticism offered by J. N. Mohanty in *Edmund Husserl's Theory of Meaning*, 1963: pp. 38–41.)

Among the leading advocates of the "meaning is use" theory are Ludwig Wittgenstein, *Philosophical Investigations*, 1953; Gilbert Ryle, "The Theory of Meaning," in *British Philosophy in Mid-Century*, ed. by C. A. Mace, 1957; N. E. Christensen, *On the Nature of Meanings*, 1961; and William Alston, *Philosophy of Language*, 1964. Among those writers who advance a dyadic theory of meaning are W. V. Quine, *Word and Object*, 1960; Charles Morris, *Signification and Significance*, 1964; and B. F. Skinner, *Verbal Behavior*, 1957. For critical discussions of diverse theories of meaning, see L. Antal, *Questions of Meaning*, 1963, and *Content, Meaning, and Understanding*, 1964; L. J. Cohn, *The Diversity of Meaning*, 1963; N. E. Christensen, *On the Nature of Meanings*, 1961; A. J. Ayer, "Meaning and Intentionality," in *Proceedings of the 12th International Congress of Philosophy*, Volume I, 1958; P. Henle, "The Problem of Meaning," in *Proceedings of the American Philosophical Association*, Volume XXVII, 1953–54; James W. Cornman, *Metaphysics, Reference and Language*, 1966.

One writer who appears to state the triadic theory in a way that very roughly corresponds to the correct version rejects it for a reason that completely begs the question. See C. E. Osgood, *Method and Theory in Experimental Psychology*, pp. 691–692. Earlier Professor Osgood concedes the fact that, in order to explain man's linguistic behavior, "meaning must be brought into the picture somehow," and then he adds "here's the rub—meaning has no accepted material correlate. If we are to hold to our materialistic moorings, we must *postulate material events for meanings*" (*ibid.*, p. 681). In a later essay, Osgood, in collaboration with Suci and Tannenbaum, again presents the triadic theory, attributing the best statement of it to Ogden and Richards, and calling it the "mentalistic view" of meaning; and concludes by saying: "If a dualistic view [i.e., a non-materialistic view] is harmonious with the truth, then the Ogden and Richards theory is the most tenable one available" ("The Logic of Semantic Variation," in *Psycholinguistics*, ed. by S. Saporta, pp. 285–286). The question whether concepts as meanings can or cannot be adequately explained in neurophysiological terms is posterior to the question whether concepts as meanings must be posited in order to give a satisfactory explanation of man's linguistic behavior. If they must be posited in order to explain man's use of names or designators, then they must be posited whether or not an adequate neurophysiological explanation can be given of the power and process of conceptual thought; and whether

or not the materialistic position is sustained or infirmed as a result. To assume the truth of metaphysical behaviorism as Osgood does, and then to make that assumption the reason for rejecting the triadic theory of meaning, is to beg the question in a most flagrant fashion. (There is no conflict between the triadic theory of meaning and methodological behaviorism; Aristotelian psychology is methodologically behaviorist.) If the triadic theory of meaning is the only one that solves the problem of how originally meaningless marks or sounds acquire meaning and become meaningful names or designators, then it must be adopted no matter what consequences it may have for the issue concerning the adequacy of neurophysiological explanations of conceptual thought. The procedure followed in this book does not beg that question. Having established man's psychological difference in kind from other animals by virtue of his having the power of conceptual thought that they totally lack, we must still face the question whether that difference in kind is superficial or radical—whether the action of the brain is the sufficient cause of conceptual thought, or only a necessary but not the sufficient cause of it.

11. The statement that concepts *are* meanings will be understood only by those who also understand that concepts are *that by which* (*id quo*) we understand or know whatever we understand or know, never *that which* (*id quod*) we understand or know. See *supra*, Chapter 10, note 8 and *infra*, Chapter 12, note 41. That which is understood or known by means of our concepts (i.e., the object known or understood) is also that which is meant by the words we use designatively (i.e., the object signified). The concept that functions as the means whereby we understand the kind of thing a dog is also functions as the means whereby we are able to use the word "dog" to signify this particular conceived in a certain way or to signify a certain class or kind to which particulars conceived in this way belong. The meaning of the designative sign is an object that we understand or conceive in a certain way; that object—the thing signified or the significate—is that which the designative sign or signifier means; the concept is that by which the sign means the object, never that which the sign means.

Hence to say that concepts *are* meanings is not to say that concepts are the significates of signs, but rather to say that concepts are the *tertium quid* through which signs mean their significates. The word "dog" does not mean the concept *dog*; the word "dog" means the perceived particular understood in a certain way or the class to which it belongs; the concept through which the perceived particular is understood is the meaning through which the word "dog" means the perceived particular conceived as a dog.

Just as concepts, as the *id quo* of our knowing or understanding, are not inspectable entities in our experience, so neither are the meanings whereby signs signify their significates. Hence to say that we

apprehend the meaning of a sign is not to say that we apprehend *that whereby it means* (the meaning itself which *is* a concept), but rather to say that we apprehend *that which it means* (the object it signifies through the concept by which we understand that object). It is of the utmost importance to distinguish these two ways in which we use the word "meaning" when we speak of the meaning of a sign: (a) on the one hand, for *that which* is meant—the significate or object signified; (b) on the other hand, for *that by which* or *that through which* the sign signifies its significate. As we saw earlier (see note 10, *supra*), the meaning of "meaning" which is (a) above is the *referent* of the verbal sign, the meaning of "meaning" which is (b) above is its *sense*. It is only as the sense of a verbal sign that the meaning *is* a concept; as the reference of a verbal sign, the meaning is never a concept, but always an object conceived or understood. Cf. Jacques Maritain, *Ransoming the Time*, 1941: pp. 222–223.

A letter written by Professor Chisholm to Professor Sellars covers many of the points in the foregoing analysis of meaning. See *Minnesota Studies in the Philosophy of Science*, Volume II, p. 533. In this letter, Professor Chisholm enunciates seven theses. Instead of quoting them here, I am going to paraphrase them in order to avoid confusion, because where I use the word "concepts," Chisholm uses the word "thoughts," and where I use the word "meaning," Chisholm uses the word "intentional." The seven theses, paraphrased accordingly, are as follows.

(1) Concepts are meanings: they are that whereby something is meant.

(2) Linguistic entities (names, sentences) are meaningful, i.e., have meanings.

(3) Nothing else is a meaning or meaningful. (This thesis, in my judgment, requires qualification, for non-verbal signs can be meaningful.)

(4) Concepts would be meanings even if there were no meaningful linguistic entities (or signs, verbal or non-verbal, that have meaning).

(5) But for man's having concepts, linguistic entities would not be meaningful. If there were no men, then the mark or noise "hund"—if somehow occasionally it got produced—would not mean dog.

(6) Concepts, through being meanings, are the source of the meanings possessed by meaningful signs; i.e., nothing would be meaningful or have meaning were it not for the fact that concepts are meanings.

(7) Hence concepts are peculiar in that they have an important characteristic which nothing else in the world has, namely, the characteristic described in (6) above.

12. Notwithstanding Locke's fundamental mistake in treating ideas as the objects signified by names, it is to his credit that he so clearly

recognized that the signification of our general or common names cannot be explained without reference to our possession of what he sometimes calls "general or universal ideas," and sometimes "abstract ideas." See *Essay Concerning Human Understanding*, III, i, 3; III, iii, 6–11. Where Locke succeeds in some measure, Berkeley and Hume, confronting the same problem (the problem of explaining the signification of general names) fail signally; see Berkeley's *Principles of Natural Knowledge*, Introduction, paragraphs 10–18; and Hume's *Enquiry Concerning Human Understanding*, Part I, Section XII, Part 1, 122. The nominalism of Berkeley and Hume, which prevents them from explaining how common names signify kinds or classes, was probably caused in part by the influence on them of Locke's own confusion of the process of concept-formation (by which "general or universal ideas" are formed) and the process of perceptual generalization which gives rise to perceptual abstractions (i.e., generalized images), but not concepts (i.e., general ideas). Even if Berkeley and Hume had been empirically correct in denying generalized or abstract images, they would still be wrong; their basic failure stems from their blindness to the distinction between perceptions, memories, and images, on the one hand, and concepts, on the other. Like Locke, they used the word "idea" primarily for sensations or perceptions and lacked a word for conceptual thought as something quite distinct from all perceptual processes. Locke's awareness of the distinction could not help but be obscured by his treatment of general and universal ideas as if they were the same as abstract ideas. In a section headed "*Brutes abstract not*," he writes: "We observe no footsteps in them of making use of general signs for universal ideas; from which we have reason to imagine that they have not the faculty of abstracting, or making general ideas, since they have no use of words, or any other general signs" (*op. cit.*, II, xi, 10). The section should have been headed: "*Brutes do not form concepts*"; for, through perceptual generalization and discrimination, brutes do attain perceptual abstractions. On this confusion in Locke, which, unfortunately, he shares to some extent, see Price, *Thinking and Experience*, pp. 43, 98, 200; and on Locke's superiority to Berkeley and Hume in dealing with the problem of verbal signs and their meanings, see *ibid.*, pp. 288–289, 291, 296, 302, 327–332, 354, 357.

13. If animals had the power of conceptual thought and could understand, for the things they were able to perceive, the kind of thing each was, then, given the equipment to make sounds which many animals have, they should be able to name things and make sentences. The fact that they do not name things and make sentences is fairly weighty evidence that they are not able to do so. This, in turn, forces us to the conclusion that they do not have the power of conceptual thought. This conclusion can hardly be negatived by saying that animals do have the power of conceptual thought, which

enables them to name things and make sentences, but, for reasons known only to them, they do not choose to exercise the power and engage in propositional speech.

14. If animals do not have concepts at all, then their perceptual experience is not of the same order as human perceptual experience, for the latter is always or for the most part illuminated by an understanding of the objects perceived that is totally absent from the perceptual experience of animals. Without concepts operative at the moment of perception, all that animals perceive in a set of similar objects is what is sensibly common to them. They do not perceive a set or series of similar objects—all functioning as equivalent stimuli in Klüver's sense of that term—as particular instances of a class or kind that they understand. In short, when rats react to different triangles in terms of their sameness as triangles, they do not perceive this set or series of visible forms as particular instances of triangularity, for they have no concept of triangle, no understanding of triangularity *as such*. Hence the perceptual abstractions attained by animals cannot be regarded as functionally the same kind of cognitive dispositions as the perceptual abstractions attained by men; for, in the human case, the perceptual abstractions always or for the most part function in conjunction with concepts, so that when the object is perceived, the perception is infused with an understanding of the kind of thing it is. Unless one understands what a triangle is, one cannot perceive this visible shape as a triangle, even though, by means of a perceptual abstraction, one may be able to recognize this shape and that shape as being of the same kind.

NOTES TO CHAPTER 12

1. See John Beloff, "The Identity Hypothesis: A Critique," in *Brain and Mind*, ed. by J. R. Smythies, 1965: p. 50; see also *ibid.*, p. 194; and H. H. Price, "Some Objections to Behaviorism," in *Dimensions of Mind*, ed. by S. Hook, 1960: p, 84, Cf. C. E. M. Hansel, *ESP, A Scientific Evaluation*, 1966.

2. The contemporary philosophers to whom general reference is here made include C. A. Campbell, R. Chisholm, R. B. Brandt, A. C. Ewing, H. D. Lewis, S. C. Pepper, M. Polany, K. R. Popper, H. H. Price, and A. Danto. Specific references to their works will be given, where relevant, in notes that follow.

3. See *Minnesota Studies in the Philosophy of Science*, Volume II, pp. 483–497.

4. See Gilbert Ryle, *The Concept of Mind*, 1949; H. Feigl, "The 'Mental' and the 'Physical,'" in *Minnesota Studies in the Philosophy*

of Science, Volume II, pp. 370–483; and "Mind-Body, *Not* a Pseudo-problem," in *Dimensions of Mind*, pp. 24–36; W. Sellars, *Science, Perception, and Reality*, 1963: pp. 1–40, 127–196; J. J. C. Smart, *Philosophy and Scientific Realism*, 1963: pp. 64–120; K. J. W. Craik, *The Nature of Explanation*, 1952; *The Nature of Psychology*, 1966; Hilary Putnam, "Minds and Machines," in *Dimensions of Mind*, pp. 148–179; U. T. Place, "Is Consciousness a Brain Process?" in *The Philosophy of Mind*, ed. by V. C. Chappell, 1962: pp. 101–109; S. Pepper, "A Neural Identity Theory of Mind," in *Dimensions of Mind*, pp. 37–55; A. Quinton, "Mind and Matter," in *Brain and Mind*, pp. 201–233. See also M. Scriven, "The Complete Robot: A Prolegomena to Androidology," in *Dimensions of Mind*, pp. 118–142; "The Mechanical Concept of Mind," in *Minds and Machines*, ed. by A. R. Anderson, pp. 31–42; Donald M. McKay, "From Mechanism to Mind," in *Brain and Mind*, pp. 163–191. For excellent and concise summaries of the identity hypothesis, see V. C. Chappell, Introduction to *The Philosophy of Mind*, and Bruce Aune, "Feigl on the Mind–Body Problem," in *Mind, Matter, and Method*, ed. by P. K. Feyerabend and G. Maxwell, 1966: pp. 17–39.

5. See Feigl, in *Minnesota Studies*, pp. 429, 482–483; Smart, "Sensations and Brain Processes," in *The Philosophy of Mind*, ed. by V. C. Chappell, pp. 160–172; W. Sellars, "The Identity Approach to the Mind-Body Problem," in *Philosophy of Mind*, ed. by Stuart Hampshire, 1966; V. C. Chappell, *op. cit.*, Price, in *Dimensions of Mind*, p. 78; C. D. Broad, *The Mind and Its Place in Nature*, 1925: pp. 622–623; Beloff, *op. cit.*, pp. 44–46; McKay, *op. cit.*, p. 190; B. B. Wolman, "Principles of Monistic Transitionism," in *Scientific Psychology*, 1965: pp. 563–593.

6. See Feigl, in *Minnesota Studies*, p. 461, and in *Dimensions of Mind*, pp. 30–34; V. C. Chappell, *op. cit.*, pp. 19–21; Bruce Aune, in *Mind, Matter, and Method*, pp. 30, 38; Smart, in *The Philosophy of Mind*; Beloff, in *Brain and Mind*, pp. 36, 39, 42.

7. See Feigl, in *Minnesota Studies*, pp. 461, 463, 471–473. Cf. R. B. Brandt, "Doubts About the Identity Theory," in *Dimensions of Mind*, pp. 60–63; and J. Beloff, in *op. cit.*, pp. 36–38.

8. See R. B. Brandt, in *op. cit.*, pp. 57–67; H. H. Price, in *Dimensions of Mind*, pp. 78–84; A. Danto, "On Consciousness in Machines," in *ibid.*, pp. 180–187; A. C. Ewing, "Professor Ryle's Attack on Dualism," in *Clarity Is Not Enough*, pp. 311–338; M. Polanyi, "The Structure of Consciousness," in *Brain*, Volume 89, Part 4, 1966, pp. 799–810; J. Beloff, in *op. cit.*; Bruce Aune, in *op. cit.*

9. See Feigl, in *Minnesota Studies*, pp. 479–482; and Smart, in *The Philosophy of Mind*, pp. 164–172; cf. *Philosophy and Scientific Realism*, pp. 92–99.

10. *Science, Perception and Reality*, pp. 30–31.

11. *Ibid.*, pp. 33–34. Cf. Smart, *Philosophy and Scientific Realism*, pp. 103–105.

12. *The Nature of Explanation*, p. 52. Cf. *ibid.*, pp. 53, 58–60.

13. *Ibid.*, p. 63. Cf. *ibid.*, pp. 98–99.

14. *The Nature of Psychology*, pp. 151, 166.

15. See *Conjectures and Refutations*, p. 298. Cf. his "Note on the Body-Mind Problem," in *ibid.*, pp. 299–303, in which Professor Popper discusses his interchanges with Professor Sellars on this subject

16. See *Brain and Mind*, p. 234. Cf. *ibid.*, p. 59.

17. See *Minnesota Studies in the Philosophy of Science*, Volume II, Appendix, pp. 507–539.

18. *Ibid.*, pp. 536–537.

19. Professor Sellars writes: "Characteristic of thoughts is their *intentionality*, *reference*, or *aboutness*, and it is clear that semantical talk about the meaning or reference of verbal expressions has the same structure as mentalistic discourse concerning what thoughts are about. It is therefore all the more tempting to suppose that the intentionality of *thoughts* can be traced to the application of semantic categories to overt verbal performances, and to suggest a modified Rylean account according to which talk about so-called 'thoughts' is shorthand for hypothetical and mongrel categorical-hypothetical statements about overt verbal and non-verbal behavior, *and* that talk about the *intentionality* of these 'episodes' is correspondingly reducible to semantical talk about the verbal components" (*Science, Perception and Reality*, p. 180). For a recent discussion of Professor Sellars' views on intentionality, see R. J. Bernstein, "Sellars' Vision of Man-in-the-Universe," in *The Review of Metaphysics*, Volume XX, No. 1, September, 1966, pp. 120 ff. As Bernstein points out, what distinguishes Sellars from other contemporary writers, such as Chisholm and Price, who make use of Brentano's theory of the intentionality of mental acts, is that Sellars, unlike the others, restricts intentionality to thoughts alone and does not extend it to sensations and feelings. In taking this position, Sellars departs not only from the theory of intentionality as revived in a somewhat corrupt form by Brentano, but also from it in its earlier and better statement by Aristotle and Aquinas (see Sellars' "Aristotelian Philosophies of Mind," in *Philosophy for the Future*, p. 556). The critical difference between the Aristotelian-Thomistic theory of the intentionality of mental acts and the recrudescence of that theory in Brentano and Husserl, is discussed in Section 6 of this chapter.

20. In *op. cit.*, p. 174. "Machine performances," Putnam writes, "may be wholly analogous to language, so much so that the whole of lin-

guistic theory can be applied to them. If the reader wishes to check this, he may go through a work like Chomsky's *Syntactic Structures* carefully, and note that *at no place is the assumption employed that the corpus of utterances studied by the linguist was produced by a conscious organism.* Then he may turn to such pioneer work in empirical semantics as Ziff's *Semantic Analysis* and observe that the same thing holds true for *semantical* theory" (*ibid.*, pp. 173–174). If the objection were raised that such works as Chomsky's and Ziff's, which are representative of behavioristic linguistics and empirical semantics, treat all linguistic operations and processes without any reference whatsoever to the meaning of the linguistic elements as signs (especially designators), Professor Putnam would reply by saying, as he does: "Of course, the objection to 'behavioristic' linguistics might *really* be an objection to all attempts at *scientific* linguistics. But this possibility I feel justified in dismissing" (*ibid.*, p. 174). See Warren McCulloch's comment on Chomsky's "analysis of context-free, phrase-structured language," as inapplicable to the linguistic behavior of man, because, as McCulloch points out, "no natural language is ever context-free, even when it is written carefully" (in *The Great Ideas Today*, 1966: p. 332).

21. In *op. cit.*, pp. 224–225. Cf. *ibid.*, pp. 220–224. And see Price's critique of contingent identity, in *ibid.*, pp. 234–235.

22. In *Minnesota Studies*, pp. 416–418.

23. Aristotle and Aquinas reject the psychophysical dualism of Plato and Descartes (involving a duality of substance—body and mind, *res extensa* and *res cogitans*) because it abrogates the existential unity of man: for them, man is one substance, not a composite of two. See Aristotle, *On the Soul*, II, 1; Aquinas, *Summa Theologica*, I, 75, 76. They also reject psychophysical interactionism on the same ground advanced by the proponents of the identity hypothesis; namely, that in positing a many-one and one-many relationship between the acts or states of the mind and acts or states of the body, it disregards the weight of empirical evidence that there is a one-one relationship between the psychical and the physical.

24. On the one hand, the reductive materialists go to the extreme of denying the analytical or logical separability of mind and body. On the other hand, the extreme immaterialists deny the existential inseparability, i.e., the empirical and contingent inseparability, of mind and body. The two moderate positions—the one advanced by proponents of the identity hypothesis and the one held by Aristotle and Aquinas—agree in rejecting both of these extremist denials; i.e., they affirm both the logical separability of mind and body, and also the empirical and contingent existential inseparability of mind and body (i.e., a one-one relationship between them, the assertion of which is tantamount to the assertion that bodily action is *at least* a necessary condition of mental acts).

25. See Price's discussion of Quinton's paper in *Brain and Mind*, pp. 234–235; see Beloff in *ibid.*; and Brandt, in *op. cit.*, pp. 60–63. Cf. Michael Polanyi, *The Study of Man*, 1963: pp. 53–70.

26. See passages referred to in notes 15, 16, and 17, *supra.*

27. In his Inaugural Lecture at Oxford in 1947, dedicated to Gilbert Ryle, Professor A. J. Ayer writes as follows: "'What do you see with?' 'My eyes.' 'What do you hear with?' 'My ears.' 'What do you touch with?' 'My hands.' 'What do you walk with?' 'My legs.' 'What do you think with?' The proper answer is there is no 'with' in this case, and that this is just one of the ways in which it differs from the others. But because it is assumed that every activity must have its special organ, a mythical entity is brought in to do the work. And so to the misleading question, 'What do you think with?' we get the even more misleading answer, 'With my mind.' A very much less misleading answer is that I think with my brain. For at least the brain can be identified as a physical existent, and there is good empirical evidence that a certain condition of the brain is *causally necessary, if not sufficient*, for the occurrence of any process of thought. But equally, there is good empirical evidence that a certain condition of the brain is *causally necessary* for the occurrence of any perceptual activity. And the only reason I can find why the brain should be regarded as specifically the organ of thought, as opposed to perception, is that in the case of thought no other organ conspicuously intervenes" (*Thinking and Meaning*, p. 5, italics added).

The moderate immaterialists would agree with Professor Ayer that the brain is a necessary condition of thought, and they would be more precise than he is in his statement about perception, for with regard to perception they would say that the sense-organs *and* the brain *together* are not only a necessary, but the sufficient condition. The question in issue—whether the brain is *only a necessary*, or is also *the sufficient*, condition of thought—is unanswered by Ayer, though there are ample indications that he, like Ryle, would be inclined to answer: *sufficient as well as necessary*. With regard to Ayer's position on the question in issue, the best indication is, perhaps, to be found in this Inaugural Lecture itself, where he argues against Professor Price's theory of the intentionality of mental acts and tries to solve the problem of the meaning of signs without reference to concepts or their objects (see *ibid.*, pp. 20–25). For a discussion of Ayer's views *vis-a-vis* those of Price, see J. N. Mohanty, *Edmund Husserl's Theory of Meaning*, 1964: pp. 5–7.

28. See Aristotle, *On the Soul*, II, 1–2; Aquinas, *Summa Theologica*, I, 76, 8; I, 77, 4, Resp. and ad 3; I, 78, 3–4.

29. See Aristotle, *On the Soul*, II, 2, $413^{b}23$–30; III, 3–5, and 7, $431^{a}14$–19. And see Aquinas, *Summa Theologica*, I, 84, 6–8.

30. See Aquinas, *ibid.*, I, 75, 3–5.

31. See Aristotle, *On the Soul*, III, 2; Aquinas, *Summa Theologica*, I, 12, 4; I, 14, 1; I, 14, 2 ad 1; I, 18, 3; I, 85, 1.

32. See John Locke, *Essay Concerning Human Understanding*, IV, iii, 6. Here Locke declares that, apart from Divine revelation, we cannot be certain that an omnipotent power did not give a fitly disposed system of matter the power to think as well as to perceive. Cf. *ibid.*, IV, x, 9; and II, xxiii, 13.

33. The argument that I regard as fallacious is the one concerning contraries; namely, that contrary qualities are never co-present in sensation or perception, and cannot be, because sensation and perception are bodily acts, and matter does not admit of the simultaneous presence of contraries; whereas contraries are sometimes co-present in our intellectual apprehensions (see Aquinas, *Summa Theologica*, I, 76, 6). Even if this were true, it would not establish the immateriality of the intellect; for a number is, as such, an immaterial entity, and it does not admit of simultaneous contraries: an integer cannot be both odd and even.

The other argument is based on what is claimed to be an empirically observed difference between the senses and the intellect. Aristotle writes: "After strong stimulation of a sense we are less able to exercise it than before, as, e.g., in the case of a loud sound we cannot hear easily immediately after, or in the case of a bright color or a powerful order we cannot see or smell; but in the case of the mind, thought about an object that is highly intelligible renders it more and not less able afterwards to think about objects that are less intelligible: the reason is that while the faculty of sensation is dependent upon the body, mind is separable from it" (*On the Soul*, III, 4, 429^a31–429^b4). If the facts are as claimed, this argument might have the force assigned to it by Aristotle and Aquinas (see *Summa Theologica*, I, 75, 3, Resp. and ad 2). But while the observation concerning the temporary impairment of the sense-organs by intense stimulation is well-authenticated, we have no equally well-established empirical evidence concerning the invigoration of our mind by objects of thought that would be comparable, in the sphere of intellection, to intense lights and sounds in the sphere of vision and hearing.

34. In *Mind, Matter, and Method*, pp. 92–102.

35. *Ibid.*, p. 101. Matson cites Feigl's enumeration of the isms generated by the mind-body problem: "materialism, mentalism, mind-body interactionism, evolutionary emergence theories, psychoneurophysiological parallelism (epiphenomenalism, isomorphism, double aspect theories), and neutral monism"; and then adds: "Aristotle would have been baffled by all this" (*ibid.*, p. 96).

36. *Ibid.*, p. 93.

37. The relevant passages in Aristotle's treatise *On the Soul* are cited in notes 28, 29, and 31 *supra.*

38. See *On the Soul*, III, 4, 429^a18–429^b23.

39. In addition to the passages in the *Summa Theologica* cited in notes 28–31 *supra*, see the following for other and more extended presentations of arguments for the immateriality of the intellect: *Summa Contra Gentiles* trans. by J. F. Anderson under the title, "On the Truth of the Catholic Faith," Book II, 1956: Chapters 49 (4), (8); 50 (3), (7); 51 (4); 59 (3), (4); 62 (4); 66 (3)–(6); 69; 75 (8), (13); 79 (7), (15). See also Aquinas treatise *Disputed Questions on the Soul*, trans. by J. B. Rowan, 1949: pp. 180–182.

40. For example, in their introduction to *Computers and Thought*, 1963, E. A. Feigenbaum and J. Feldman raise the question about the prospects of carrying experiments with artificial or machine intelligence to the point where a manufactured robot will be able to do everything that a human mind can do. "Is there any reason to suppose that we shall never get there?" they ask; and their answer is: "None whatever. Not a single piece of evidence, no logical argument, no proof or theorem has ever been advanced which demonstrates an insurmountable hurdle along the continuum" (p. 8). Either they are totally unaware of the arguments advanced by Aristotle and Aquinas, or they have studied them carefully and rejected them as not logical or not demonstrative. Of these two alternatives, my guess is that the first is more likely. What is true of Feigenbaum and Feldman and their colleagues in the field of computer technology is equally true of most, if not all, of the twentieth-century philosophers who have been cited in this chapter either as proponents or as opponents of the identity hypothesis. In spite of the fact that philosophical behaviorists who are moderate materialists have much in common with Aristotle, they fail to recognize and profit from that affinity. One is inclined to wonder what effect *The Concept of Mind* might have had upon contemporary thought if Ryle, in taking his strong stand against the Cartesian dualism that has pervaded modern thought, had seen himself, not as standing in Aristotle's shoes, but as standing on his shoulders.

41. The argument briefly summarized on pages 220–222 deserves expansion for those who may be interested in its details. The argument rests on two controlling principles, both metaphysical: one with respect to the metaphysics of knowledge (*note*: the metaphysics, not the psychology, of knowledge); the other with respect to the metaphysics of existence relative to knowing and things known. I will first expound these two principles, and I will then state the argument that puts them to use.

(1) *The metaphysics of knowledge: the relation of knower and known.* The process of knowing is such that there must be some-

thing in the knower whereby he knows that which he knows. Let us call *that by which* the knower knows whatever it is that he knows the "quo" of knowing. Let us call *that which* the knower knows in any act of knowing, the "quod" of knowing.

To deny the *quod* of knowing is to assert that there is knowledge without an object known; which is impossible. Nothing is here being assumed about the manner of existence of the object known. All that is being asserted is that for every act of knowing there is an object known.

To deny the *quo* of knowing is to assert that there is knowledge without any factor in the knower that accounts for his knowing that which he knows. Nothing is here being assumed about the manner of existence of that cognitive factor—the *quo* of knowing —whatever it is. All that is being asserted is that for every act of knowing there is a cognitive factor in the knower—that whereby he knows whatever it is that he knows.

To this distinction between the *quod* and the *quo* of knowing, it may be objected that they are one and the same thing. To say this is to say that *knowing is like eating.* Just as the thing to be eaten becomes the thing being eaten by entering into the body of the eater, so the thing to be known becomes the thing being known by entering into the mind of the knower. According to this view of knowledge, there is no *quo* of knowing, for the *quod* of knowing—that which is known—is itself in the knower, just as the food is itself in the eater. The falsity of this view can be seen as follows. The physical and chemical properties of the thing to be eaten are present in the process of that thing's being eaten, and enter into the explanation of its nutritive value. But if the physical and chemical properties of the thing to be known were present in the process of that thing's being known, then fire perceived would burn the perceiver, which is not the case.

It may also be objected that, although the *quod* of knowing never enters into the constitution of the knower, as food enters into the constitution of the eater, knowing involves nothing more than the attention of the knower to that which is known. To say this is to say that *knowing is like illumination.* The act of knowing is like a beam of light thrown on the knowable, thereby making it known. According to this view of knowledge, there may be a *quo* of knowing, but it is not something in the knower, any more than the beam of light that illuminates an object is *in* the source of the illumination. The act of knowing, like the act of illuminating, is a transitive action by the knower on the knowable, rendering it known, without there being anything in the knower whereby he knows that which he knows.

The falsity of this view can be seen as follows: If the act of knowing were a transitive act merely changing the object from the knowable to the known, then the known object would always be present to the knower exactly as it is, and there could be no

explanation of how we make errors in our knowledge of things, or assert false claims to knowing that which does not exist at all or does not exist as we claim to know it. The evidence of illusions and hallucinations in the field of perception is sufficient to dismiss this view of knowing which makes it analogous to "lighting up" the object known.

We are, therefore, left with a real distinction between the *quod* and the *quo* of knowing—between that which we know and that whereby we know that which we know. In addition, we can now assert two things about the *quo*. (a) It is something that exists in the knower—exists in some manner, but, in any case, exists apart from the existence of the *quod*. (In the case of hallucinations, it is the existence of the *quo* unaccompanied by the existence of the *quod* which accounts for the perceptual error that is made by the subject of the hallucination.) (b) Since the *quo* is not identical with *quod* as something present in or present to the knower, the *quo* is representative of the *quod*. This second point requires a word of further explanation. To speak of the *quo*—the cognitive factor in the knower—as a representation of the *quod* (that which is known) is to assert two things, one negative, the other positive. The negative point is simply the assertion of the non-identity of *quod* and *quo*. The positive point is the assertion of a similitude between *quod* and *quo*.

If the *quod* and the *quo* of knowing are not identical, which means that they are two distinct entities, then either there is some relation between them, or none. But knowledge is a relation between knower and known; hence it cannot be the case that there is no relation between the *quo* and the *quod* of knowing. Now, if there is some relation between the *quo* and *quod* of knowing, it is either a relation of similitude or some other type of relation. The only other type of relation that could explain the act of knowing is a causal relation. That the *quod*—the object known—is in some way a cause of knowing need not, and probably cannot, be questioned; but that does not explain how the *quo*—that whereby we know that which we know—is the cause of our knowing. So far as I can see, the only explanation of the efficacy of the *quo* as somehow a cause of our knowing that which we know lies in its having a similitude to the *quod*—that which is known. This can be tested by a *reductio ad absurdum*. Try to conceive the *quo* as having no similitude whatsoever to the *quod*, and still try to understand how it functions as that whereby we know that which we know. If you find this impossible, as I do, you will conclude, as I do, that the *quo* of knowing is something in the knower that, by virtue of its similitude to the *quod* of knowing, represents the latter and so can function as that whereby we know that which we know.

One point of explanation is necessary. The similitude between *quo* and *quod*, by virtue of which the *quo* is representative of

the *quod*, is not itself knowable, i.e., it cannot be an object of knowledge. Another way of saying this is that the *quo* is self-effacing: being that whereby we know, its whole being consists in its functioning to make the *quod* known. This is the meaning of "representation." It makes something other than itself present; namely, the object known, the *quod*. That is why, traditionally, the *quo* of knowing is called an "intentional being," something whose whole being consists in intending another. To function as a representation is to function intentionally.

In order not to beg, at this point, any questions about conceptual thought, let me illustrate the foregoing analysis of knowledge by applying it to perceptual processes, and especially to what contemporary psychologists, neurologists, and computer technologists, call "perceptual abstractions"—that whereby the machine or the animal (non-human as well as human) reacts to sensible shapes or patterns in such a manner that the animal or machine can be said to *cognize* or *apprehend* the pattern. To explain a cognition or apprehension of this sort, the scientists try to construct, theoretically at least, the pattern that must exist in the brain or in the electrical network of the machine, and that must have sufficient similitude to the pattern being cognized or apprehended, in order that it may function as the *quo* of knowing. The work done by Warren McCulloch in this field, especially his famous essay on the perception of auditory and visual forms, together with the work on the Perceptron and similar devices, perfectly exemplify the point I am here making. To say that there must be, in the nervous system or in the network of the Perceptron, a pattern that bears some resemblance to the pattern being cognized or at least being reacted to in a discriminating way, is to assert the need for a *quo* in the cognitive agent that has some resemblance to the *quod* being cognized.

(2) *The metaphysics of existence as applied to the quod and quo of knowing.* Let us begin by considering only that which can be known or that which is known; for the moment, let us omit any reference to that in us whereby we know whatever we know. And, in order to avoid begging questions at this point in the argument, let us also exclude reference to any type of known object a particular instance of which cannot be perceived by the senses.

With these restrictions in force, it can be asserted that all the particulars we know or can know exist materially; that is, have the physical properties of material things. This can be explained as follows. We never perceive *chair as such* or *tree as such*, but always *this particular chair*, or *that particular tree*. The particular thing perceived is always a unique individual thing, non-identical with any other instance of the same kind of thing, even though it is also a particular instance of the same kind in those respects

which do not make it this one unique individual. Things that are otherwise alike as instances of the same kind have certain features that distinguish them as individuals and make them so many different particular instances of the same kind. Principal among these individuating marks or features are the unique spatio-temporal determinations of the individual thing.

Since the spatio-temporal determinations of a thing are physical properties of it, it can be asserted (a) that whatever exists as an individual exists physically, i.e., has a material mode of existence; (b) that whatever has a material mode of existence, exists as an individual, i.e., exists with certain individuating features that make it a unique existence as well as a particular instance of this or that kind of thing. *This equation of individual mode of existence with material mode of existence applies to everything we know perceptually.* The things we know perceptually we know as individuals and as particular instances of kind. In other words, the *quod* of perceptual knowledge always has the individuating marks or features that betoken its material mode of existence. Now let us ask about the *quo* of perceptual knowledge—the representative factor in us whereby we perceive this or that individual thing or particular instance. Applied to this question, the principle of similitude between the *quo* and the *quod* of knowing yields the following answer: to be that whereby we know something as an individual, the *quo* must itself have individuating marks or features. But it can have such marks or features only if it has a material mode of existence. Hence we are brought to the conclusion which, from other relevant evidence, we have every reason to believe is the case; namely, that the *quo* in us that represents the perceptually known object, and is that whereby we know it as an individual, exists materially in us, specifically as a state or pattern of our central nervous system.

(3) We are now in a position to state the argument for the immateriality of conceptual thought. First, let us recall that the inference from man's possession of propositional language to his possession of the power of conceptual thought involves the following points. The sentences of propositional language are composed, in part, of names or designators having denotative and connotative significance. The originally meaningless physical marks or sounds that are designators or names only when they have such significance cannot get their meaning either from the object designated or from our perception of the object designated. To understand this, we need only remember that the particular object named "poodle," "dog," "mammal," etc.—each name with a different denotative and connotative significance—is the same individual thing under all these designations, and that our perception of it as that individual thing remains the same as we

apply different designations to it. This leads us to the conclusion that, since it is not the object itself nor our perception of it that bestows meaning on the marks or sounds we use as designators, the only thing left that can bestow meaning is our conception or understanding of the objects we name. Hence, in contradistinction to percepts, concepts must be that whereby we know classes as such. If we did not have percepts, whereby we know individuals as such, we could not use proper names significantly to designate this or that individual thing. So, if we did not have concepts, whereby we know classes or kinds as such, we could not use common or general names significantly to designate the class or kind to which this and that individual belong as individually particular instances.

Before we take the next and last step in the argument, let us observe a certain parallelism between percepts and concepts. Percepts and concepts function as the *quo* of knowing: they are that in us whereby we know that which we know: in the one case, the individual as such; in the other case, the various classes or kinds to which the individual belongs. Percepts and concepts are also the *quo* of meaning (that whereby our words get their significance as designators): in the one case, our proper names; in the other, our common or general names. They could not be the second without being the first; that is, they could not be that by which we use words meaningfully as proper or as common names, if they were not, first of all, that by which we know that which we know—either individuals as such or the classes of which they are particular instances. The parallelism extends to one further point; whatever is a *quo* of knowing must be a representation or intention of the object known, existing in us; and, as a representation whereby we know that which we know, it must have an appropriate similitude to that which we know by means of it.

This brings us to the final step in the argument. We saw a little earlier that perceptual representation, in order to function as the *quo* of our knowing individuals as such, must have a mode of existence akin to the mode of existence of that which is known as an individual. If the latter exists materially under individuating conditions, so must the perceptual representation whereby we know it. Now if conceptual representations were also to exist in the same way that perceptual representations do (i.e., materially, as definite states of the central nervous system), they could not function as the *quo* of our knowing classes or kinds as such. Hence we must face the question: "How do classes or kinds—traditionally called 'universals'—exist?"

One answer to this question is that they exist as such quite apart from knowers. This answer carries with it the attribution to the existent universal of a non-physical or immaterial mode of existence. Another answer to this question is that they exist as that

which is common to a number of individuals, all of which are, by virtue of their common characteristic, particular instances of the universal. But, according to this answer, the universal does not exist *actually* as a universal when it exists only as that which is common to so many individuals; and it does not then exist actually as a universal because it exists in matter, under individuating conditions. A third answer to this question is that universals exist, and now *actually* as universals, in the knower. They are, in the knower, that whereby he knows what is common to a number of individuals; or, in other words, the classes or kinds of which individuals are particular instances. But they could not, as the *quo* of knowing kinds or classes, be actual universals if they existed materially, for then they would exist under individuating conditions.

All these answers to the question about how universals exist make the same point, namely, that a material mode of existence, which entails individuating conditions, precludes the existence of *actual universals, either* in the knower *or* apart from the knower. We can see in passing that the nominalist who denies the existence of universals, in the knower as well as apart from the knower, must either be a materialist, as in the case of Hobbes, or must, as in the case of Berkeley and Hume, maintain that all knowledge is by means of perceptions or perceptual residues. Since Berkeley and Hume do not give a neurological account of perceptual knowledge or thought, they fail to explain why our perceptual representations cannot be universal (in their words, cannot be "abstract or general ideas").

Thus we reach the conclusion that conceptual representations, which function as the *quo* of our knowing classes or kinds, cannot exist in us in a material mode of existence. Perceptual representations, which function as the *quo* or our knowing individuals as such, do exist in us materially—as states of our nervous system. To deny that conceptual representations have a material mode of existence in us is to deny that they exist as states of our nervous system (or as brain patterns). This, in turn, is tantamount to saying that man's power of conceptual thought cannot be entirely explained in terms of neurological mechanisms. Or, in other words, the brain is not by itself the sufficient condition of conceptual thought. Some other factor—and, necessarily, an immaterial or non-physical factor—must be posited to explain conceptual thought.

Here, then, is the nerve of the direct argument in four propositions. (a) Our concepts are that in us whereby we apprehend the universal aspects of the things we think and talk about. (b) To perform that cognitive function, our concepts must be actual universals. (c) But for anything to be an actual universal, its mode of existence must be immaterial. (d) Hence, the existence in man of conceptual thought cannot be adequately explained by the action

of a material organ, such as his brain, but requires the presence and operation of an immaterial factor.

There is one difficulty intrinsic to the argument, which must be faced. That which is known conceptually is always a universal, never an individual. But unless we affirm that universals actually exist, in the manner of Platonic ideas, we must recognize that the object of conceptual knowledge does not exist as such; namely, as an actual universal. Hence, we must say that existent individual things are known conceptually when they are known, not in their individuality, but in their universal aspects, i.e., in those respects in which they, as individuals, have common characteristics or traits. But if this is so, then it would appear that the mode of existence of the actual thing that is known is material, whereas the mode of existence of that whereby it is known in its universal aspects is immaterial; and hence, the principle of similitude between *quo* and *quod* would appear to be violated.

This difficulty is resolved, so far as it can be resolved, by the distinction that was made, in the course of the argument, between the potential and actual existence of the universal. It exists potentially in individual things insofar as they have common characteristics or traits, in virtue of which they belong to classes or kinds. It exists actually in the knower as that whereby he knows individual things in their universal aspects. There is a similitude here between the *quod* and the *quo* in that the one is potentially what the other is actually. In addition, it should be pointed out that the similitude between the *quod* and the *quo* of conceptual knowing is different from the similitude between the *quod* and *quo* of perceptual knowing; for in the latter case both exist actually in a material mode of existence, i.e., under individuating conditions. The acknowledgement of this difference between perceptual and conceptual knowing does not invalidate the argument. Failure to acknowledge this difference leads to the Platonic error of attributing actual existence to that which is known conceptually, by a false parallelism to the actual existence of that which is known perceptually. In addition, acknowledging this difference enables us to account for the fact that our conceptual knowledge extends to the non-sensible aspects of things that have a material mode of existence; for example, our concept of inertia or valence, or our concept of justice or of freedom, is that whereby we understand a universal aspect of things, but a universal of which particular instances cannot be directly perceived by means of our senses.

42. See *Summa Theologica*, I, 84, 7–8.

43. For relevant discussions of aphasia and agnosia, see *Cerebral Mechanisms in Behavior*, ed. by L. A. Jeffress, pp. 184 ff., and 259; J. M. Nielsen, *Agnosia, Apraxia, Aphasia*, 1936: esp. pp. 255–256; W. Penfield and L. Roberts, *Speech and Brain Mechanisms*, 1959: pp. 117, 127; K. Goldstein, *Language and Language Disturbances*,

1948: pp. 22–26, 56, 63; G. Humphrey, *Thinking*, 1951: pp. 236–256; *Brain Function*, Volume III, ed. by E. C. Carterette, 1966: pp. 67–92, 141–172.

44. For brain growth in the first two years of human life in relation to the appearance and development of human speech in the infant, see J. C. Lilly, *Man and Dolphin*, Appendix Two, pp. 278–286, and especially Table VI, p. 285.

45. See Warren S. McCulloch, *Embodiments of Mind*, pp. 46–66; also in *ibid.*, pp. 1–17, 72–156, 307–318; K. M. Sayre, *Recognition*, 1965; and "Human and Mechanical Recognition," in *The Modeling of Mind*, ed. by K. M. Sayre and F. J. Crosson, 1963: pp. 166–170; N. Sutherland, "Stimulus Analyzing Mechanisms," in *ibid.*, pp. 174–175; D. McKay, "Mindlike Behavior in Artefacts," in *ibid.*, pp. 228–229, 232–233, 237–241; O. G. Selfridge and U. Neisser, "Pattern Recognition by Machine," in *Computers and Thought*, ed. by E. A. Feigenbaum and J. Feldman, 1963: pp. 237–238, 250; L. Uhr and C. Vossler, "A Pattern–Recognition Program That Generates, Evaluates, and Adjusts Its Own Operators," in *ibid.*, pp. 251–252, 267–268; M. Minsky, "Steps Toward Artificial Intelligence," in *ibid.*, pp. 407–408, 411–413; W. Sluckin, *Minds and Machines*, 1960: pp. 143, 195. See also "The Relevance of Neurophysiology for Anthropology," in *Cross-Cultural Understanding*, ed. by F. S. C. Northrop and H. H. Livingston, 1964: pp. 339–355; and W. McCulloch, "A Historical Introduction to the Postulational Foundations of Experimental Epistemology," in *ibid.*, pp. 180–193.

46. Without concepts, we would only perceive, as animals do, the individual thing; and if we reacted to a number of individually differing things in the same way, we would not be cognizing what is common to them or knowing them in their universal aspects; we would only be reacting to them as functionally equivalent stimuli. By means of concepts, and only by means of concepts, we understand kinds or classes as such, entirely apart from perceived particulars and even though no particular instances exist. By means of percepts alone—*if that ever occurs in human cognition*—we would apprehend individual things without any understanding of them. This is the meaning of Kant's statement that percepts without concepts are blind, and concepts without percepts are empty. Hence, if we are right in thinking that men have and other animals lack the power of conceptual thought, then we must also assert a difference in kind between perceptual processes in animals which are blind in Kant's sense, and perceptual processes in man which are enlightened by concepts. Cf. Chapter 11, note 14, *supra.*

47. In my judgment, the correct interpretation of the phenomena is that given by Professor Heinrich Klüver in *Behavior Mechanisms in Monkeys*, pp. 4–10, 326–330, 344–349. According to Klüver, the experimental data shows that the animal can be trained, just as

machines can be built, to discriminate between equivalent and non-equivalent stimuli. Such discrimination—as, for example, between triangular and non-triangular shapes—does not show that the animal or the machine understands this individual stimulus as a particular instance of the class of triangular things. Neither the rat nor the machine understands triangularity as such. To understand the individual as a particular instance of a class is possible only if there is some understanding of the class—the universal—as such. But it is precisely an understanding of the class—the universal—as such that is the work of conceptual thought. Hence if animals had such understanding, they would have the power of conceptual thought; and if they had the power of conceptual thought, they would also have the power of propositional speech. As Locke pointed out, the lack of propositional speech on the part of animals is adequate reason for denying to them the power of conceptual thought (see *supra*, Chapter 11, notes 12 and 13). Hence, when animals, lacking this power, react in the same way to a number of individually differing instances of the same shape, their behavior indicates *only* the functional equivalence of the stimuli *and nothing more*. For the views of the computer technologists and neurologists on the reaction of machines to equivalent and non-equivalent stimuli, see the works cited in note 45 *supra*; and also M. A. Arbib, *Brains, Machines, and Mathematics*, 1964: pp. 33, 41–49, 108, 112–113, and A. Rapoport, "Technological Models of the Nervous System," in *The Modeling of Mind*, pp. 30 ff. The best statement that I have found in the current literature concerning the distinction between perceptual abstraction and concept-formation (between perceptual generalization and discrimination and the cognition of kinds or universals) is the one made by Aron Gurwitsch in the paper "On the Conceptual Consciousness" in *ibid.*, see pp. 199–205, esp. 202–204.

NOTES TO CHAPTER 13

1. See N. Chomsky, *Syntactic Structures*, 1957; P. Ziff, *Semantic Analysis*, 1960; Cf. W. S. McCulloch and W. M. Brodey, in *The Great Ideas Today*, 1966: pp. 296–297, 331–333.

2. *The Philosophical Works of Descartes*, ed. by E. S. Haldane and G. R. T. Ross, Volume I, p. 116.

3. *Ibid.*, pp. 116–117.

4. *Ibid.*, pp. 117–118.

5. *Ibid.*, pp. 116–117.

6. Pointing out that, other than man, there is no animal "however perfect and fortunately circumstanced it may be," that can utter

statements by which it makes known its thoughts, Descartes adds: "It is not the want of organs that brings this to pass, for it is evident that magpies and parrots are able to utter words just like ourselves, and yet they cannot speak as we do, that is, so as to give evidence that they think of what they say" (*ibid.*).

7. See John von Neumann, *The Computer and the Brain*, 1958: pp. 60–68; W. S. McCulloch and W. M. Brodey, in *The Great Ideas Today, 1966*, pp. 307–313; K. S. Lashley, in *Cerebral Mechanisms in Behavior*, p. 72; and P. Weiss, in *ibid.*, pp. 75–77, 89–91. Professor Weiss points out that the critical role played by brain chemistry tends to invalidate computer models of the brain's action, because the latter are entirely electronic in their functioning, whereas brain processes are electro-chemical. On the role played by RNA in the biochemistry of memory, see Karl H. Pribram, "Proposal for a Structural Pragmatism," in *Scientific Psychology*, pp. 433–438. All of these findings relate solely to information storage and retrieval —the retention of learned patterns of behavior—*not to memory as knowledge of the past.*

8. "The Problem of Serial Order in Behavior," in *Cerebral Mechanisms in Behavior*, pp. 112–118, 120–133; and cf. P. Weiss, in *ibid.*, p. 140–142.

9. See *Agnosia, Apraxia, Aphasia*, 2nd ed., 1965: p. 22. Cf. W. Penfield and L. Roberts, *Speech and Brain Mechanisms*, 1959: pp. 228–234.

10. See *Mind, Perception, and Science*, 1951: p. 30; and cf. *ibid.*, pp. 23–30, 40–41, 86. See also his "Speech and Thought, in *The Physical Basis of Mind*, 1957; Sir Charles Sherrington, *Man on his Nature*, 1941: Chapters IX, XI, XII; Roger W. Sperry, "Mind, Brain, and Humanist Values," in *New Views of the Nature of Man*, ed. by J. R. Platt, 1965: pp. 71–92. For involvement of the neurologists in the discussion of the identity hypothesis, see *Brain and Mind*, ed. by J. R. Smythies, pp. 54–55, 60; and *The Philosophy of Mind*, ed. by V. C. Chappell, pp. 107–108.

11. See K. S. Lashley, *op cit*, pp. 134–135; M. A. Arbib, *Brains, Machines and Mathematics*, pp. 47–48; W. McCulloch, *Embodiments of Mind*, Chapters 1, 7, 17, 19; W. C. Halstead, *Brain and Intelligence*, Chapters I, IV, XVII; J. C. Eccles, *The Neurophysiological Basis of Mind*, Chapter VIII.

12. *Science, Perception and Reality*, p. 30.

13. See McCulloch and Brodey, in *The Great Ideas Today, 1966*, p. 330.

14. See *Man and Dolphin*, pp. 255–278.

15. See *ibid.*, Chapters 1 and 12, esp. p. 204 ff.

16. See the "second objection and reply" in Chapter 12, *supra*, pp. 224.

NOTES TO CHAPTER 14

1. See A. M. Turing, "Computing Machinery and Intelligence," in *Computers and Thought*, ed. by E. A. Feigenbaum and J. Feldman, 1963: pp. 30–35; P. Armer, "Attitudes Toward Intelligent Machines," in *ibid.*, pp. 392–393; M. Minsky, "Steps Toward Artificial Intelligence," in *ibid.*, p. 407; M. Scriven, "The Mechanical Concept of Mind," in *The Modeling of Mind*, ed. by K. M. Sayre and F. J. Crosson, 1963: pp. 243, 248–249; D. A. Bell, *Intelligent Machines*, 1962: pp. 61–67, 88–90. Many writers who dismiss programmed computers as incomparable with human minds fail to take cognizance of the basic distinction between a programmed computer and a random network robot with no more than "infant" programming: see, for example, Jonathan Cohn, "Can There Be Artificial Minds?" in *Analysis*, Volume 16, No. 2, N.S. No. 50, pp. 36–41. With regard to the conception of infant programming see Turing, *op. cit.*, pp. 31–32.

2. See John von Neumann, *The Computer and the Brain*, pp. 46–50; M. Scriven, *op. cit.*, pp. 248–249; J. J. C. Smart, *Philosophy and Scientific Realism*, pp. 107–111.

3. See F. Crosson and K. Sayre, "Modeling: Simulation and Replication," in *The Modeling of Mind*, pp. 4, 13, 18–23; E. A. Feigenbaum and J. Feldman, in *Computers and Thought*, pp. 269–270; P. Armer, in *ibid.*, pp. 397–398; M. Taube, *Computers and Common Sense*, 1961: pp. 72, 75–76. For criticisms by neurologists and others of the computer technologists' efforts to replicate brain processes, see von Neumann, *op. cit.*, pp. 41, 81–82; M. A. Arbib, *Brains, Machines, and Mathematics*, pp. 5–7, 93–117; Lord Russell Brain, *Mind, Perception, and Science*, p. 86; P. Weiss, in *Cerebral Mechanisms and Intelligence*, pp. 75–79, 89–91, 140; C. J. Herrick, *The Evolution of Human Nature*, pp. 431–448; W. H. Thorpe, *Learning and Instinct in Animals*, pp. 175–176; cf. his *Science, Man and Morals*, p. 51; E. B. Hunt, *Concept Learning*, pp. 212–218. In this connection see also Feigl's comment on the lack of proteins in Scriven's "androids," in *Minnesota Studies in the Philosophy of Science*, Volume II, p. 451; and cf. p. 423.

4. See W. Sluckin, *Minds and Machines*, revised edition, 1960: pp. 159, 174–177; D. A. Bell, *op. cit.*, 1962: pp. 61–67, 88–90; M. Taube, *op. cit.*, pp. 47–49; Herbert A. Simon, in *Control of the Mind*, ed. by S. M. Farber and R. H. L. Wilson, pp. 222–231, and cf. *ibid.*,

pp. 282–285; P. Ziff, "The Feelings of Robots," in *Minds and Machines*, ed. by A. R. Anderson, pp. 98–103; J. J. C. Smart, "Professor Ziff on Robots," in *ibid.*, pp. 104–105; Ninian Smart, "Robots Incorporated," in *ibid.*, pp. 106–108; A. Newell, J. C. Shaw, and H. A. Simon, "Chess-Playing Programs and the Problem of Complexity," in *Computers and Thought*, pp. 39–70; H. Gelernter, "Realization of a Geometry-Theorem Proving Machine," in *ibid.*, pp. 158–159; A. Newell and H. A. Simon, "GPS, A Program That Simulates Human Thought," in *ibid.*, pp. 279, 292–293; E. A. Feigenbaum, "The Simulation of Verbal Learning Behavior," in *ibid.*, pp. 297–309; M. Minsky, "Steps Toward Artificial Intelligence," in *ibid.*, pp. 425, 435, 446–450; and editorial summaries in *ibid.*, on pp. 269–270, 272–273, 275–276. See also A. Hormann, "Gaku: An Artificial Student," in *Behavioral Science*, Volume 10, No. 1, January, 1965, pp. 88–107.

5. See M. Taube, *op. cit.*, *passim*, esp. pp. 60, 120. Extravagant claims are made by W. McCulloch, *Embodiments of Mind*, 1965: *passim*; J. J. C. Smart, *Philosophy and Scientific Realism*, 1963: pp. 111–116, 119–125; M. Scriven, "The Mechanical Concept of Mind," in *The Modeling of Mind*, pp. 243–254; "The Complete Robot: A Prolegomena to Androidology," in *Dimensions of Mind*, pp. 118–142; Hilary Putnam, "Minds and Machines," in *ibid.*, pp. 148–179; D. McKay, "Mindlike Behavior in Artefacts," in *The Modeling of Mind*, pp. 225–241, "From Mechanism to Mind," in *Brain and Mind*, p. 190; A. Newell and H. A. Simon, *op. cit.*, p. 293; E. A. Feigenbaum, *op. cit.*, p. 308; M. Minsky, *op. cit.*, p. 447; Much more moderate claims, together with confessions of present inadequacies or of the slightness of present achievements are to be found in K. M. Sayre, "Human and Mechanical Recognition," in *The Modeling of Mind*, pp. 157–170; N. Sutherland, "Stimulus Analyzing Mechanisms," in *ibid.*, pp. 171–197; J. Lucas, "Minds, Machines and Gödel," in *ibid.*, pp. 255–271; M. Minsky, *op. cit.*, pp. 406, 408; see also editorial summaries in *Computers and Thought*, pp. 7–8, 275–276; E. B. Hunt and C. I. Hovland, "Programming a Model of Human Concept Formulation," in *ibid.*, pp. 319–325; J. O. Wisdom, "Mentality in Machines," in *Proceedings of the Aristotelian Society*, Supplementary Volume XXVI, 1952, p. 26.

A delightful discussion of these claims and counter-claims will be found in *The New Yorker*, June 11, 1966, Notes and Comments, pp. 27–28. It quotes H. A. Simon as saying several years ago that "there are now in the world machines that think, that learn, and that create. Moreover, their ability to do these things is going to increase rapidly until—in a visible future—the range of problems they can handle will be co-extensive with the range to which the human mind can be applied." Against this, it cites Professor H. L. Dreyfus of M.I.T. as saying in 1966 that computers cannot do these

things and won't do them. Dreyfus, according to *The New Yorker*, compared the pertinacity and extravagant claims of the computer technologists to that of the alchemists. "By defining 'progress' as displacement toward the ultimate goal, today's alchemists, the cognitive-simulation workers, obscure the prospects for artificial intelligence. According to this definition, Dreyfus points out, the first man to climb a tree could claim progress toward flight to the moon."

6. See W. Sluckin, *op. cit.*, p. 129; J. von Neumann, *op. cit.*, pp. 46–50; W. S. McCulloch, *Embodiments of Mind*, pp. 72–87.

7. See A. N. Turing, *op. cit.*, pp. 19–20; A. Newell and H. A. Simon, *op. cit.*, pp. 2–3; P. Armer, *op. cit.*, pp. 390–393; M. Minsky, *op. cit.*, pp. 407–408, 425, 446–450; W. Sluckin, *op. cit.*, pp. 196–201; 215–216; D. A. Bell, *op. cit.*, p. 67; D. McKay, "From Mechanism to Mind," in *Brain and Mind*, pp. 163–191; and cf. *ibid.*, pp. 193–195, 199–200.

8. See A. N. Turing, *op. cit.*, pp. 11–12, 20, 21–29, 30–35; and for a characterization of Turing and his work, see Jeremy Bernstein, *The Analytical Engine*, 1963: pp. 96–103.

9. For espousal of the hypothesis and prediction developed in terms of Turing machines, see Hilary Putnam, *op. cit.*, pp. 148–158, 175–176; M. Scriven, Postscript to "The Mechanical Concept of Mind," in *The Modeling of Mind*, pp. 253–254; J. J. C. Smart, *op. cit.*, pp. 128–130. For adverse comments on claims made for Turing machines, see J. Lucas, *op. cit.*, pp. 270–271; and K. Gunderson, "The Imitation Game," in *Minds and Machines*, pp. 62–64, 69–71.

With regard to the currently debated problem concerning the possibility that a machine can either be programmed to use or can, by learning, acquire the use of a natural language, such as English, see J. Pfeiffer, *The Thinking Machine*, 1962: pp. 147–150; M. Taube, *op. cit.*, Chapters 3 and 5; B. F. Green, A. K. Wolff, N. Chomsky, and K. Laughery, "Baseball: An Automatic Question Answerer," in *Computers and Thought*, p. 207, 214–216; R. K. Lindsay, "Inferential Memory as the Basis of Machines Which Understand Natural Language," in *ibid.*, pp. 217–220, 223–224, 233; M. Minsky, "Steps Toward Artificial Intelligence," in *ibid.*, pp. 412–413; editorial comment, in *ibid.*, p. 8; Hilary Putnam, in *Dimensions of Mind*, pp. 173–175. See also Jan Srzednicki, "Could Machines Talk?" in *Analysis*, Vol. 22, No. 5, N.S. No. 89, April, 1962, pp. 113–117. This last is offered as a demonstration that they cannot be programmed to talk, using a natural language such as English. But even if the demonstration is sound, that leaves open the question whether a Turing machine, with only infant programming, could learn to use English. Turing and his confreres think that it can be mathematically shown to be, *in principle*, possible.

10. For statements of the materialist position, as that is now expressed with faith in the prospects for critical advances in neurophysiology and in computer technology, see W. Sluckin, *op. cit.*, pp. 230–232; J. J. C. Smart, *Philosophy and Scientific Realism*, pp. 94–130 *passim*; M. Scriven, Postscript to "The Mechanical Concept of Mind," in *The Modeling of Mind*, pp. 253–254; cf. Addendum to *ibid.*, in *Minds and Machines*, p. 42; P. Armer, *op. cit.*, p. 399; M. Minsky, *op. cit.*, p. 449; W. Sellars, *Science, Perception and Reality*, pp. 69–71; S. Toulmin, reviewing Arthur Koestler's *Act of Creation*, in *Encounter*, Volume XXIII, No. 1, July, 1964, pp. 69–70.

NOTES TO CHAPTER 15

1. In my judgment, being able to play the Turing game successfully is an all-or-none affair. A robot either passes the conversational test or fails. Among human conversationalists, some are more articulate, more versatile, wittier, cleverer, more resourceful, and so on. They can be ranked on a scale of degrees. So too, perhaps, there may be, among future generations of Turing machines, manifestations of lower and higer degrees of conversational ability. But between the first robot that manifests such an ability to the slightest degree (i.e., a degree just sufficient to pass the conversational test) and all earlier machines that do not manifest any conversational ability whatsoever, there is a difference in kind, not of degree.

It may be thought, however, that before that happens, improvements in machine intelligence may be made that will give the technologist the impression that he will eventually succeed in building a Turing machine that can pass the conversational test. With regard to this point, I would like to quote the comments of a correspondent:

> "If in 1980 a machine is built that can perform all the feats of today's machines, plus the added feat of paraphrasing English sentences, it would rank higher on the scale of accomplishment than today's machines. All these attempts would still score zero in Turing's game. But it is plain that, with a more advanced machine at hand, there is more hope for achieving the minimum passing score in the future than there would be with less advanced machines at hand. Thus we must take into account the possibility of building machines that are ever more advanced on the scale of how much they accomplish, but all of which fail decisively on the conversational test. Under these circumstances, a reasonable person could still argue that the probability of eventual success in Turing's game has increased in spite of every trial's still being a failure."

If one concedes that, what effect does it have on the statement that, with repeated trials and failures, the relative truth of the materialist hypothesis diminishes and the relative truth of the im-

materialist hypothesis correspondingly increases? My answer to this question is contrary to the one that my correspondent had in my mind. He thought that one would have to say that, as the probability of eventual success in the Turing test increased, we would become more and more assured of the truth of the materialist hypothesis. The opposite seems to me to be the case. If, with technological advances being made, it becomes more and more probable that a Turing machine will eventually be built, successive failures to build a machine that can pass the conversational test tend to weaken our confidence that one will ever be produced. The more probable it is that something can happen, the more disappointing is its failure to happen.

NOTES TO CHAPTER 16

1. The distinction made here between reasons of expediency and reasons of principle needs a word of further explanation. I have used the phrase "reasons of expediency" as it is often used in everyday speech to cover those *ad hoc* justifications of action that recommend the action solely on the ground that it serves the purpose at hand. It suits us to treat our pets as if they were persons, while slaughtering other animals to satisfy our wants. The justification of these opposite lines of conduct is *ad hoc*: each serves a different purpose. To say this and no more is to offer a reason of expediency. In contrast, if I could establish, *as a matter of fact*, that my household pet differs in kind from the pigs and steers that are butchered for my table; and if, in addition, I could defend the *principle* that different kinds of treatment are appropriate to things that differ in kind, then I could justify my opposite lines of conduct in a fashion that is not *ad hoc* and that does not appeal merely to the purpose that the action serves.

I have used the phrase "reasons of principle" for those justifications of conduct that appeal to antecedent facts and principles, not merely to consequences (i.e., purposes to be served). Reasons of principle, as the foregoing example indicates, never consist of principles alone, but always of principles combined with assertions of fact; and the principles involved are always normative rules or prescriptions (i.e., statements about what ought or ought not be done). I have called such statements principles in order to distinguish them from the statements of fact with which we associate the given reasons for action, not in order to elevate them to the level of indubitable or incorrigible truth. This use of the word "principle" conforms to everyday usage. When we say, in view of a person's conduct or character, that he is a "man of principle," or when we say that "it is not the money, but the principle that matters," the kind of principles that we have in mind are moral principles, that

is, normative or prescriptive statements about what ought or ought not to be done or sought. In line with this use of words, when I refer to principled conduct, I mean conduct that is justified by reasons of principle (reasoning that appeals to a normative principle in conjunction with an assertion of fact); and when I refer to unprincipled conduct, I mean conduct that is justified only by *ad hoc* reasons of expediency (by reference only to the purpose the conduct serves or the desirable consequences that one expects from it).

If no empirical evidence were available that could help us to decide whether human and non-human animals differ in kind or only in degree, men might still make *ad hoc* differentiations that suited their purposes. In an essay entitled "Slaves and Machines" (in *Analysis*, Volume 22, No. 5, N.S. No. 89, April, 1962, pp. 118–120), Amelie O. Rorty argues that that is all they can ever do. In her view, when we call some entity a slave, a brute animal, or a machine, the designation merely expresses how we *want* to treat the entity so designated—specifically, *not* as a man or a person. We assert to be a matter of fact that which we wish to believe, because the belief in question is the basis for our acting in a certain way, and what is ultimately decisive is the way in which we want to act toward this or that entity. Rorty's argument proceeds without any regard for the logic involved in the process of determining whether two things differ in degree or in kind, and without any cognizance of the wealth of empirical evidence that is now available to decide how men differ from other things. It is historically true, of course, that men have in the past treated other men *as if* they were not different in kind from brute animals or from inanimate machines; in many parts of the world, they still do so today. There is nothing here to condemn, according to Rorty; and she would be right if there were no facts to show that all men are the same in kind, by virtue of commonly possessing the trait (the power of conceptual thought) which makes them different in kind from other animals and from any machines that now exist.

Other writers make the same mistake that Rorty does—the mistake of thinking that the decision whether an entity under consideration (be it a man or a machine) is a person or a thing depends entirely on how we act with respect to it, how we wish to treat it, or how we talk about it. This puts the cart before the horse and totally ignores the possibility that the question can be decided entirely by an appeal to observed behavioral facts. See Peter T. Manicas, "Men, Machines, Materialism, and Morality," in *Philosophy and Phenomenological Research*, Volume XXVII, No. 2, December, 1966, pp. 238–246; Hilary Putnam, "Robots: Machines or Artificially Created Life?" in *Philosophy of Mind*, ed. by Stuart Hampshire, 1966; and Edward Shils, "The Sanctity of Life," in *Encounter*, Volume XXVIII, No. 1, January, 1967, pp. 39–49. If a robot were to succeed in passing the Turing test, or to manifest a mind of its own in answering questions and carrying on a conversation, then the

immaterialist hypothesis would be falsified. In that case, the refusal to call the robot a person while still calling men persons would have no justification in fact and could only be interpreted as an expression of self-serving bias or discrimination. If having the power of conceptual thought were the only factual criterion of being a person, then the conversational robot would be no less a person than a man is. But if, as I will argue in Chapter 17, the presence of an immaterial factor is indispensable to being a person, because indispensable to freedom of choice, then should we find that both men and robots have the power of conceptual thought, but that neither have freedom of choice because neither have the immaterial or nonphysical power requisite for such freedom, then we must, in accordance with the facts, concede that neither men nor conversational robots are persons, and that there is nothing wrong with treating them as things.

2. What is called the naturalistic fallacy in moral reasoning or argumentation consists in attempting to draw normative conclusions from assertions of fact. I commit this fallacy if the only grounds or reasons that I offer for my recommendation that this or that ought or ought not to be done consist of the views I hold concerning the nature of things, i.e., assertions I make concerning the way things are. The nature of things—the way things are—does not by itself validly support any normative conclusions, i.e., any statements about what ought or ought not to be done. I do not commit the fallacy of supposing that the nature of things leads to moral conclusions when I employ moral principles in my reasoning and combine these moral principles with statements of fact about the nature of things (i.e., when I combine an ought-premise with an is-premise to arrive at an ought-conclusion). See my discussion of this point in *The Conditions of Philosophy*, pp. 188–195.

It is a misunderstanding of the naturalist fallacy to hold that facts have no normative consequences at all. While it is true that facts by themselves (unaccompanied by appeal to normative principles) do not have normative consequences, they do have such consequences when they are subsumed under normative rules; e.g., the fact that A ignored a red light leads to a normative judgment about A's driving only when it is subsumed under the rule that red lights ought to be heeded by drivers. As Professor Smart points out, "no account of scientific facts about the world can *by themselves* determine what we should do. Some philosophers and scientists have tried to deduce ultimate ethical precepts from the conclusions of evolutionary biology . . . Scientific facts *alone* cannot give us a precept. This is not to say that scientific facts are not of the greatest importance for ethics. It is simply that scientific facts do not *by themselves* determine any ethical system" (*Philosophy and Scientific Realism*, p. 154; italics added). In the context of this passage, Professor Smart also writes: "What ethical precepts we recommend

depends in the last analysis on what we *want*" (italics his). The truth of this statement depends in the last analysis on what the writer means by "wants." It is false if he means merely the purpose to be served in a particular case by a particular action; for then, as indicated in note 1, *supra*, the recommendation that this or that line of conduct be pursued to serve our needs is not an ethical, or normative, precept at all. When Professor Smart himself enunciates the ethical precept that those who give or receive arguments, as scientists in fact do, ought to be respected as persons (see *ibid.*, p. 155), that ought-statement does not depend on whether, in a particular case, we *want* to achieve a certain result or have a certain purpose in mind.

3. Consider the person who maintains that it makes no practical difference whether man differs from other things only in degree or in kind as well, *because*, without any reference to the facts of the matter, we can justify any line of conduct that we wish to pursue in our treatment of men, on the one hand, and of animals and machines, on the other. If we examine this attitude (it is one that I have met not only in scientists but also in professors of law and of political science), we find that it rests on two errors: (1) the error of supposing that because facts *by themselves* do not support normative recommendations, they have no relevance whatsoever to normative problems; and (2) the error of supposing that, given the same state of facts, quite opposite practical policies or courses of action can be justified by reference to the purpose at hand. Such *ad hoc* justification shifts from time to time, and from case to case, as our purposes change. No consistency is to be expected in our policies. We can excuse ourselves for doing what we condemn in others on the ground that, even though the facts are the same in both cases, our conduct served the purpose of the moment, whereas the conduct of others worked in the opposite way so far as we were concerned. But if the justification of conduct requires us to subsume the facts of the case under a normative principle that applies to all cases without regard to who the parties are and what their momentary purposes may be, then opposite courses of conduct can be justified only by appealing to opposite normative principles; and then the question of which of the conflicting principles is the right one must be faced. When our conduct is *principled*, we must be prepared to defend the soundness of the principles on which we act and if we act on a certain principle in one case, we cannot justify acting in an opposite way in another case in which the facts are the same and the same principle applies. But when our conduct is *unprincipled*, we may concoct a "justification" or explanation of our conduct, if one is called for, and we seldom find insuperable difficulties in the way of rationalizing opposite policies or courses of action, even when the facts are the same in the cases in which, to serve our purposes, we act in opposite ways.

In this connection, the following example of inconsistency is instructive. In his "Apology for Raimond de Sebonde," Montaigne claims that the observable facts of human and animal behavior lead to the conclusion that animals are man's equals, if not superiors. Nevertheless, in his essay "Of Cruelty," he criticizes those tribes or cultures which admit animals to human status and associate with them on the same plane of conduct that applies to human beings (see *Essays of Montaigne*, trans. by Charles Cotton, revised by W. C. Hazlett: Volume 4, pp. 163–166). Spinoza, on the other hand, maintains, as a matter of fact, that men are rational and brutes are not, and therefore they differ in kind; accordingly, he says that "the law against killing animals is based upon an empty superstition and womanish tenderness rather than upon sound reason. A proper regard, indeed, to one's own profit teaches us to unite in friendship with men, and not with brutes, nor with things whose nature is different from human nature" (*Ethics*, Part IV, Prop. 37, Scholium 1). Cf. Kant's exposition of the thesis that it is wrong to treat men and not wrong to treat other animals merely as means: *Critique of Practical Reason and Other Works on Ethics*, trans. by T. K. Abbott, 6th ed., pp. 46–53; *Critique of Teleological Judgment*, trans. by J. C. Meredeth, pp. 99–100.

NOTES TO CHAPTER 17

1. See *Man and Dolphin*, Chapters 1 and 12. Cf. Lilly's more recent book: *The Mind of the Dolphin: A Nonhuman Intelligence*, 1967.

2. *Ibid.*, pp. 211–212. Considering Dr. Lilly's prediction that, if dolphins and humans engage in conversation and thus appear to share a common intellectual power, some groups of men will probably advocate that we treat them as we treat human beings, a reader of this book in manuscript suggested to me that the opposite result might also occur. It is just as likely, he wrote, that some group of men "will take the view that a large part of the human race is *no better* than dophins, and should therefore cease to have the rights currently accorded to human beings. In effect, this was the argument of the Germans with respect to Poles and Jews. Without denying that the Poles and Jews were biologically human, the Nazis maintained that they were in other respects sub-human, and more like animals or things. In short, the effect of the discovery that men do not differ in kind from animals is just as likely to promote malevolence toward some human groups as benevolence toward dolphins or other animals that are found not to differ in kind from men."

I have nothing to say about the relative probability of Dr. Lilly's prediction or my friend's prediction of the actual consequences that might follow from the discovery that men and dolphins do not

differ in kind. I have no way of estimating which guess is shrewder or more likely to be true. When, in this chapter I consider the practical consequences of man's being different in kind from other animals—or, in the case of the dolphins, perhaps the same in kind —I am concerned *only with what ought or ought not to be the result of one or another state of facts, not with predictions of what might or might not actually result.* In other words, by *practical* consequences, I mean *normative consequences*—consequences in the form of the normative conclusions that we reach in the light of the facts as ascertained, not consequences in the form of actions taken, regardless of whether or not they can be justified in the light of the facts and sound normative principles (see *supra*, Chapter 16, notes 1 and 2).

My friend obviously understood Dr. Lilly to be doing no more than making a prediction. I understood him to be considering the legal and ethical problem that the human race will have to face if and when dolphins show themselves to have the power of conceptual thought. I, therefore, read him as taking the position that if and when it is ascertained, as a matter of fact, that dolphins and men do not differ psychologically in kind, justice will require us to treat dolphins as persons and accord to them the same rights that we accord to men as persons. The action predicted by my friend would not be justified by the facts as ascertained, if they were subsumed under the normative principle that all persons (i.e., all living organisms that have the power of conceptual thought *in any degree*) ought to be treated in the same way—as persons, not as things. Nazi policies with regard to Poles and Jews, or similar policies with regard to Negroes, which have longed prevailed and are still not eradicated, cannot be justified by the facts (that all human beings have the power of conceptual thought to some degree, and that every human being, even the least, therefore differs psychologically from the most intelligent animal) when those facts are subsumed under the correct normative principle that, as a matter of right or justice, all human beings ought to be treated in the same way (as persons rather than as things), and accorded the rights of persons. If the facts were otherwise—if men and other animals differ only in degree, and if some men are superior to other men in degree, as much as if not more than some men are to some animals—then Nazi policies in the treatment of Poles and Jews, or segregationist policies in the treatment of Negroes, would not be, *prima facie*, wrong as a matter of principle; the only question to be determined would be the question of fact about the inferiority of Jews or Poles to Germans, or Negroes to white men.

3. *Op. cit.*, in *The Modeling of Mind*, p. 254.

4. *Ibid.* Cf Hilary Putnam, "Minds and Machines," in *Dimensions of Mind*, pp. 175–176; Donald M. McKay, "From Mechanism to Mind," in *Brain and Mind*, pp. 180–190.

5. *Science, Perception and Reality*, pp. 39–40.

6. For Professor Smart's views, see *Philosophy and Scientific Realism*, pp. 153–154; and cf. *ibid.*, pp. 93–105, 111–116, 119–125. For Professor Sellars' views, see *Science, Perception and Reality*, pp. 6, 15–17, 30–34.

7. *Philosophy and Scientific Realism*, p. 155.

8. In a brilliant essay, Jacques Maritain outlines the importance of the question of man's difference for the conception of human equality, showing how divergent conceptions of the equality of men stem from divergent views of man as a species and how they give rise to divergent normative recommendations (see "Human Equality," in *Ransoming the Time*, 1941: pp. 1–32). Among its other current projects, the Institute for Philosophical Research is engaged in the dialectical clarification of the idea of equality in Western thought. Even at this early stage of the work, it has become clear that the central and controlling issue in the whole discussion is constituted by conflicting views about the specific equality of men as persons in relation to all the inequalities that arise from their individual differences, and that these views are resolvable into conflicting views of the difference of man.

9. *Critique of Practical Reason and Other Works on Ethics*, trans. by T. K. Abbott, 6th ed., p. 180. Cf. *ibid.*, pp. 46–53; and *Critique of Teleological Judgment*, trans. by J. C. Meredith, pp. 99–100. The Christian conception of personality, like Kant's, involves an element of immateriality. The Christian dogma that man is made in the image of God, Who is pre-eminently a person, attributes personality to man as reflecting the divine being in this respect, i.e., immateriality.

10. I have treated these problems at greater length in another book of much earlier date (see *A Dialectic of Morals*, 1941, Chapter IV, esp. pp. 58–59). While I would revise what is there said in many respects were I to address myself anew to the problems of moral philosophy, as I hope to do in a book I am now working on, the points made there would remain essentially unchanged, at least so far as they bear on the relevance to morality of the way that man differs from other animals.

11. See Robert Ardrey, *The Territorial Imperative*, 1966; and also his *African Genesis*, 1961. Both books are engaging popularizations of the findings of ethology, full of fascinating stories of animal behavior; but both are also flagrant examples of special pleading for the questionable thesis that instinct governs human life exactly as it does animal life. The truth of that thesis depends upon how man differs from other animals; if man differs even superficially in kind from other animals, it is in important respects false; if man

differs radically, it is wholly false. In his zeal to explain human behavior and human life in terms of animal instincts, Ardrey does not pause to consider the facts bearing on the question of how man differs. He assumes the truth of the answer that suits his *ad hoc* rhetoric. The fact that books of this sort are dismissed for what they are by the scientific community does not prevent them from bemusing and misleading the laymen who read them for the enjoyable animal stories they contain and uncritically swallow the thesis along with the stories.

12. *Op. cit.*, trans. by J. Riviere, 1930: p. 63. Cf. Chapter III, *passim.*

13. *The Future of an Illusion*, trans. by W. D. Ronson-Scott, 1928: p. 93.

14. Freud's attribution of an intellectual power to man that is not possessed to any degree by other animals is all of one piece with his theory of distinctively human erotic love, as contrasted with the sexuality of other animals, a sexuality that is devoid of love even when it involves the instinctive inhibition of aggressive behavior and so gives the *appearance* of tenderness and benevolence. Nevertheless, for Freud every form of human love is erotic, either overtly sexual or a sublimation of sexuality. But if the human intellect has the autonomy that it would have to have in order to control the instincts and to sublimate them, and if that, in turn, depends on the intellect's transcendence of physical causality, then, contrary to Freud's theory of love, the non-erotic forms of human love (such as the *amor intellectualis dei* of Spinoza, the appetitive character of which takes its special form from intellectual cognition rather than from sense-perception) would be explicable without reference to sex, sensuality, or sublimation.

15. *On Aggression*, pp. 238 ff. Though Lorenz discusses free will in relation to "the laws of natural causation" governing human and animal behavior, he shows little or no understanding of free choice (see *ibid.*, Chapter 12, esp. pp. 225, 228–229, 231–232). An excellent critical review of the book by S. A. Barnett points out the illicit use that Lorenz makes of superficial analogies between human and animal behavior, and also the inconsistencies into which he falls by his effort to plead a case beyond what the acknowleged facts will support (see *Scientific American*, Volume 216, No. 2, February, 1967, *ibid.*, pp. 135–137).

16. *Ibid.*, p. 254. Cf. *ibid.*, pp. 240–254.

17. See *ibid.*, Chapter 7, esp. p. 110.

18. *Ibid.*, p. 248. In another place, Lorenz refers to "the functions of reason and moral responsibility which first came into the world with man and which, provided he does not blindly and arrogantly

deny the existence of his animal inheritance, give him the power to control it" (*ibid.*, p. 215).

19. *Ibid.*, p. 247.

20. See especially Lorenz' concluding chapter, "Avowal of Optimism," in *ibid.*, pp. 275 ff.

NOTES TO CHAPTER 18

1. See *Honest to God*, 1963: esp. Chapter 2, "The End of Theism"; and *The New Reformation*, 1965: esp. Appendix II, "Can a Truly Contemporary Person *Not* Be an Atheist?"

2. For a fair sample of the bourgeoning literature of the "new theology," see T. J. J. Altizer and W. Hamilton, *Radical Theology and the Death of God*, 1966; T. J. J. Altizer, *The Gospel of Christian Atheism*, 1966; W. Hamilton, *The New Essence of Christianity*, 1966; G. Vahanian, *No Other God*, 1966; *The Death of God*, 1957; P. Van Buren, *The Secular Meaning of the Gospel*, 1953; H. Cox, *The Secular City*, 1965; *New Theology*, ed. by M. E. Marty and D. G. Peerman, Nos. 1, 2, 3, and 4, 1964–1967; K. Hamilton, *God is Dead, The Anatomy of a Slogan*, 1966; Austin Farrer, *God Is Not Dead*, 1966; D. E. Jenkins, *Guide to the Debate About God*, 1966; *The Secular City Debate*, ed. by D. Callahan, 1966; Leslie Dewart, *The Future of Belief*, 1966.

If all the oratory, repetition, loose-talk, double-talk, and plain nonsense were removed from the thousands of pages cited above, they could be boiled down to less than a hundred pages of solid substance. The puzzling question, not satisfactorily answered, is why these "new theologians," who implicitly and inconsistently espouse a completely naturalistic materialism, continue to call themselves theologians and persist in trying to give some meaning to the term "God." Better the honest if also somewhat rhetorical atheism of Nietzsche, who coined the phrase "death of God," and of Feuerbach, whose *Essence of Christianity* replaced theology with anthropology and initiated the "religion of humanism."

The works cited above would be better described as representing the death of theology. However, there is a lively contemporary debate going on between theists and atheists that shows how far from dead theology is. See, for example, Martin Buber, *Eclipse of God*, 1952; J. Lacroix, *The Meaning of Modern Atheism*, 1965; J. C. Murray, *The Problem of God*, 1964; E. L. Mascall, *The Secularization of Christianity*, 1965; W. Earle, J. M. Edie, and J. Wild, *Christianity and Existentialism*, 1963; *New Essays in Philosophical Theology*, ed. by A. Flew and A. MacIntyre, 1965; *The Meaning of the Death of God*, ed. by Bernard Murchland, 1967.

3. See Étienne Gilson, *Reason and Revelation in the Middle Ages*, 1938, esp. Chapter 1.

4. See *ibid.*, Chapter 3. See also Aquinas, *Summa Theologica*, Part I, Q. 1, AA. 1–2, 5–6, 8.

5. See "Vatican Council II, Declaration on Religious Freedom," #2, p. 269, in *The Documents of Vatican II*, 1966.

6. See encyclical of Pius XII, *Humani Generis*, no. 36, 1950: pp. 16–17.

7. See "Vatican Council II, *Constitution of the Church in the Modern World*," #14, p. 212 in *op. cit.*

8. See in *ibid.*, #17, p. 214.

9. See Bernard Ryan, *The Evolution of Man*, 1965: pp. 138–139, 151–156; P. Schoonenberg, *God's World in the Making*, 1964: Chapter 2; J. Donceel, "Teilhard de Chardin," in *Thought*, Volume XL, No. 158, 1965: esp. pp. 383–389. Cf. David Lack, *Evolutionary Theory and Christian Belief*, 1961. Two contemporary Protestant writers claim to see no conflict between a completely naturalistic materialism, on the one hand, and Christian doctrines about the spirituality of man and the immortality of the soul, on the other: see C. W. Kegley, "Problems in the Contemporary Understanding of Man," in *Lutheran World*, Volume XII, No. 1, 1965: pp. 28–33; and D. M. McKay, "From Mechanism to Mind," in *Brain and Mind*, pp. 186–190. Commenting on McKay's essay, John Beloff writes: "It would indeed be a presumption on the part of an agnostic like myself to challenge McKay on points of Christian doctrine or biblical exegesis. If he assures me that Christianity is quite compatible with the truth of Mechanism or Materialism, I am quite happy to take his word for it but he must not complain if he has increased my suspicion that Christianity (at least as professed by someone at McKay's level of sophistication) is compatible with anything at all" (in *ibid.*, pp. 194–195).

10. See P. Weiss, *Nature and Man*, 1947; *Man's Freedom*, 1950; M. Capek, "The Doctrine of Necessity Re-Examined," in *The Review of Metaphysics*, Volume V, No. 1, September, 1951; C. Hartshorne, "Causal Necessities: An Alternative to Hume," in *The Philosophical Review*, Volume LXIII, No. 3, October, 1954; "Freedom Requires Indeterminism and Universal Causality," in *The Journal of Philosophy*, Volume LV, No. 19, September, 1958. For a critical summary of the position taken by these three writers, see *The Idea of Freedom*, Volume II, 1961: pp. 362–368; and cf. *ibid.*, pp. 640–642.

11. Between 1953 and 1961, the Institute for Philosophical Research carried on an extensive study of the discussion of freedom in the tradition of Western thought, in the course of which it undertook

to reconstruct and clarify the controversy concerning the freedom of the will. The Institute's findings and formulations were published in the two volumes of *The Idea of Freedom*, Volume I in 1958, Volume II, in 1961. It is in the light of the work done by the Institute that I here report the finding that, with few exceptions, the philosophers who affirm the freedom of the will understand free choice in terms of a mode of causality that is non-physical: in their view, the denial of a non-physical or immaterial factor in the constitution of man would entail a denial of free choice. This is confirmed by the correlative finding that the philosophers who deny free will do so on the ground that the only mode of causality that is operative in man as well as in the rest of nature is one that has its model in the action and reaction of bodies: for them as well as for their opponents, to affirm mechanism and materialism in the case of man is to deny what has come to be called the "contra-causal" freedom of the will (where "contra-causal" means not the absence of causality, but the presence of a mode of causality that is not found in the actions and reactions of physical things). See *The Idea of Freedom*, Volume I, pp. 423–494; Volume II, pp. 221–463.

12. For a dialectical examination of opposite views on this subject, see *The Idea of Freedom*, Volume II, pp. 488–525.

13. For the statement of Kant's doctrine on this point, see the passages cited in Chapter 17, note 3.

14. See W. Sellars, *Science, Perception and Reality*, pp. 25–30, 34–37; J. J. C. Smart, *Philosophy and Scientific Realism*, pp. 64–105. Cf. my statement of this challenge as it applies to classical materialism from antiquity to the end of the nineteenth century, in *The Conditions of Philosophy*, pp. 155–156, and Chapter 12; see esp. fn. 28 on p. 224.

15. If the existence of man as a person, i.e., as a physical being with a non-physical or immaterial element in his constitution, cannot be accounted for by the operation of the same natural causes that account for the origin of all other species of living things, then either the origin of man is inexplicable, or the operation of a supernatural cause must be posited to explain man's existence. The line of reasoning indicated here might constitute the strongest and simplest form of *a posteriori* argument for the existence of God as the indispensable cause of the *coming to be* of a being known to exist; and it would reinforce the much more difficult and debatable form of *a posteriori* argument that posits the existence of God as the indispensable cause of the being, *not the coming to be*, of anything that is known to exist and is known to be capable of either existing or not existing. The reason why the inference from the existence of man to the existence of God has seldom, if ever, been employed in natural theology is that the establishment of the

premise (the proposition concerning a non-physical or immaterial element in the constitution of man) has always rightly been regarded as no less difficult than the establishment of the conclusion; perhaps much more so. The reader who examines the statement of the traditional argument for the immateriality of the human intellect, as summarized in Chapter 12, note 41, will find this much more complicated and subtle than the traditional argument for the existence of God as the creative cause of whatever exists that can also not exist. But if the failure of repeated efforts to build a Turing machine able to pass the conversational test has the effect of weakening the materialist hypothesis and of strengthening the opposite view that the brain is not the sufficient cause of conceptual thought in man, then the premise required may be sufficiently established by empirical evidence, so that the subtle and complicated argument for the immateriality of the intellect need not be exclusively relied on; in which case, the positing of God's causality to explain the origin of man would become the strongest and simplest form of *a posteriori* argument for God's existence.

16. See *The Conditions of Philosophy*, Chapter 12.

17. If the science fiction writers and the scientific speculators are anywhere in the neighborhood of the truth, the future is also likely to include, as a result of space exploration, the discovery of intelligent beings elsewhere in the cosmos. As far as I can see or think, the alternatives set forth in this book concerning the difference of man from everything else on earth would apply to the difference of man from such extra-terrestrial beings. If these extra-terrestrial beings are corporeal and animate, and, either by propositional speech or in some other way, manifest their possession of the power of conceptual thought, then we must be prepared for the following alternatives: we will find either (a) that they differ only in degree from man or (b) that they differ superficially in kind. The first alternative needs no explanation; men differ from one another in the degree to which they possess the power of conceptual thought. The second alternative can be explained by analogy. If Aristotle and other conservative thinkers were correct in their hypothesis that some men are by nature born slaves and some are by nature born to be free, that would divide the human group, all members of which possess the power of conceptual thought, into two kinds —a superior kind and an inferior kind. This difference in kind would be a superficial difference in kind if it resulted from a critical threshold in the continuum of degrees of conceptual power, the superior men being able to perform certain functions because their degree of conceptual power is above this critical threshold, and the inferior men totally unable to perform these functions because their degree of conceptual power is below it. Now, the future possibility we face is that the extra-terrestrial intelligent beings that we dis-

cover may be our superiors in kind, but only superficially, by virtue of having a degree of conceptual power that lies above a critical threshold below which falls the conceptual power of terrestrial mankind. In that case, these extra-terrestrial intelligent beings will be able to perform certain functions that we cannot perform at all to any degree. The science fiction writers envisage two other possibilities. One is that we may find corporeal but inanimate intelligences, i.e., intelligent machines, possessing the power of conceptual thought; in which case, the alternatives just considered would still apply. The other possibility can only be described as incorporeal intelligences having the power of conceptual thought or a power superior to that, such as the power of non-discursive intuitive thought that is attributed to the angels in the tradition of Western theology. Such beings, if they existed, would be radically different in kind from men; in fact, it can be argued that any being that was radically different in kind from man by virtue of having an intellectual power not possessed to any degree by him would have to be an angel, i.e., a totally incorporeal being, not just a physical organism with an immaterial or non-physical power. Whether such beings can or do exist is a highly disputable philosophical question, but it should be beyond dispute that, if such beings do exist, they cannot be discovered by space exploration or by means of scientific investigation.

18. See *The Conditions of Philosophy*, pp. 174–177; and Chapter 17: "Philosophy's Future."

19. The decisive confirmation of materialism in the near future by the success of a Turing machine in passing the conversational test would cause little shock or embarrassment in learned circles if they continue to move in the direction that characterizes their doctrinal predilections in the twentieth century. I am including here not only the leading representatives of the natural and the social sciences, but also all forms of *avant-garde* thought in philosophy, theology, and religion. Only a few scientists who persist in raising questions that they think science cannot answer, only a few philosophers who stubbornly hold onto doctrines generally regarded as out-moded, and only a few orthodox theologians, mainly Roman Catholics, would be seriously challenged by such confirmation. But a progressive strengthening of the immaterialist hypothesis by repeated failures in the effort to build a Turing machine that can pass the conversational test would have earth-shaking effects throughout the learned world of the future. And to whatever extent the attitudes that now prevail among those laymen who, in some degree, are touched by the world of learning, reflect the naturalistic materialism and atheism of the learned, then a reversal in those attitudes might also be anticipated as a consequence of an altered state of mind on the part of the learned.